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APRIL 1999

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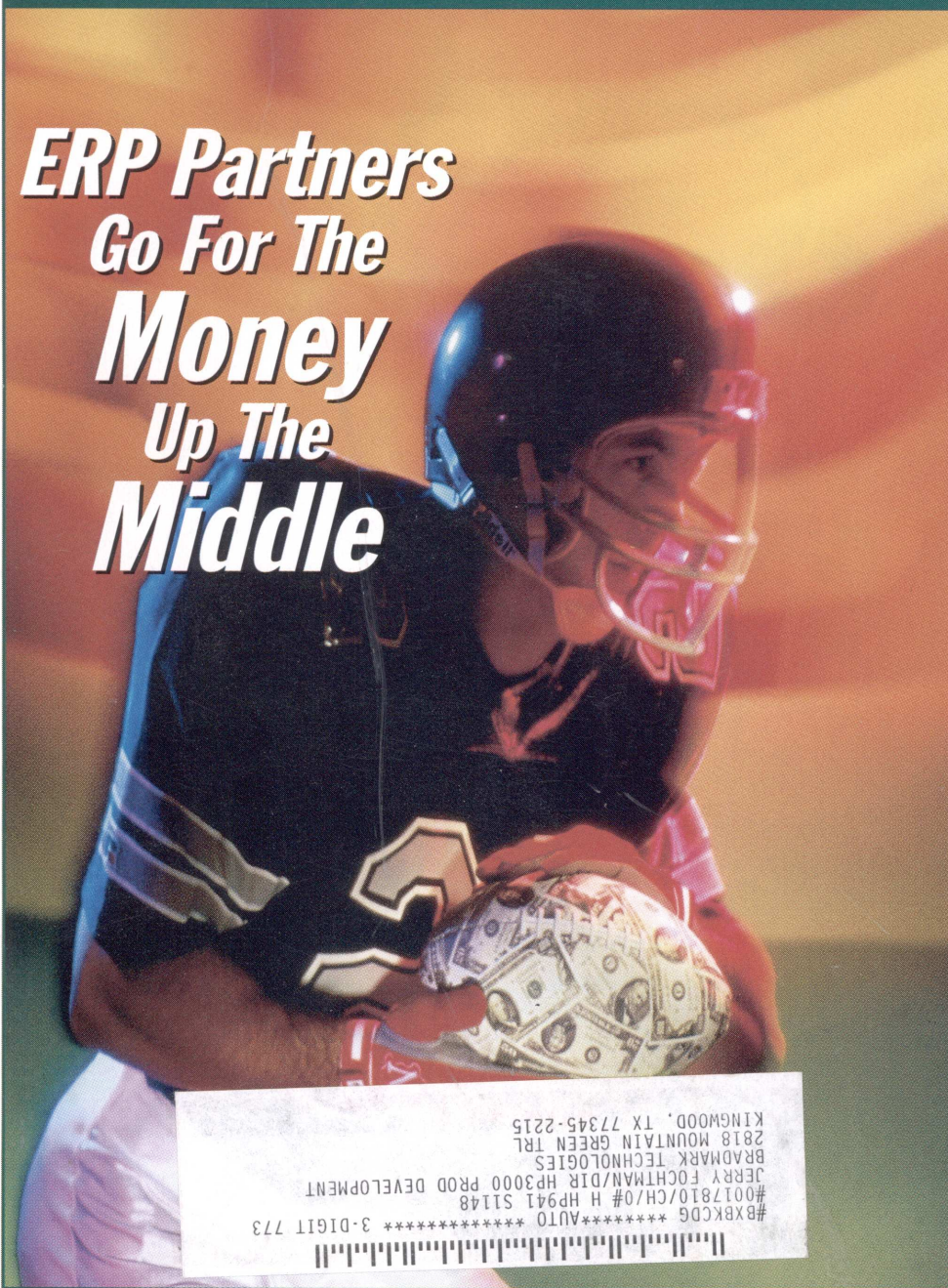
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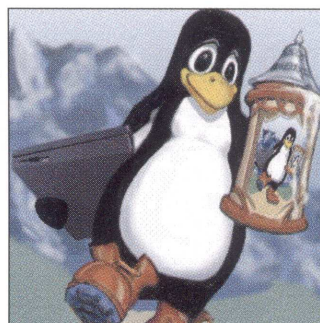
Vikram Metha **PAGE 24**

HP North American
Marketing Manager

Outside The Box

A
Toast
To
Open
Source

PAGE 8



HP-UX Admin Man

Making Time For UNIX

On The Server Side

NT's SFU Sides With UNIX?

The Plane Truth

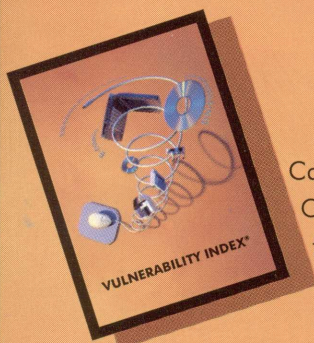
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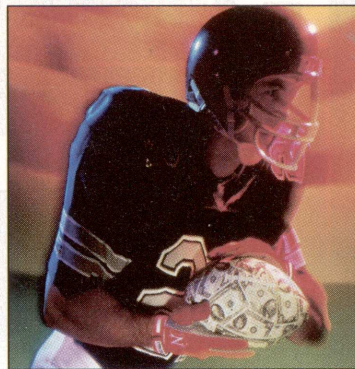
MANAGING TECHNOLOGY IN THE FACE OF CHANGE

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HP Professional

Vol. 13 No. 4

APRIL 1999



HP RESELLERS AND SYSTEM INTEGRATORS

14 High Tech High Touch In Action

How can you keep your far flung staff and customers well informed of the latest technology in a time of shrinking travel and training budgets? Simple. Use the latest technology. **By Ken Deats**

18 Integration From The Ground Up

Keeping the implementation simple was the rule when Air Transport, a part of the Canadian federal government, privatized its operations. KPMG helped them get the IT project off the ground.

By John Richer

30 Back Through The Middle And Around Again

ERP resellers are taking the middle ground. And they are pulling vendors, resellers and integrators into the game plan. **By Susan Aluise**

WORKSTATIONS

36 HP-UX Admin Man: A Life In A Day Learning UNIX

Learn UNIX in 24 hours from a book? Don't drop out of those newbie UNIX classes just yet.

By Fred Mallett

SERVERS

38 On The Server Side: NT Adds On UNIX — Almost

Are you tired of complaining about Windows NT's lack of UNIX interoperability. You might be able to find it in the *Windows NT Services for UNIX Add-On Pack* (SFU). And then again, you might not.

By Ryan Maley

CHANNELS

42 Channelling: Managing ERP Ecosystems

Are you a lone wolf out there in the ERP wilderness? You better start looking for some friends.

By Chris Wood

OUTSIDE THE BOX

8 Closing In On Mainstream Apps

The Open Source Movement is really moving these days. Even HP has lined up Linux for PA-RISC. Find out if it's moving in your general direction.

By Ken Deats

HP PROFILES

24 A Conversation With Vikram Metha

HP's got a new channel strategy. And you're probably thinking, it's about time. Find out all you want to know from the man behind HP's All Channel Strategy.

By George A. Thompson

DEPARTMENTS

3 Editorial

5 Letters

44 New Products

46 Marketplace

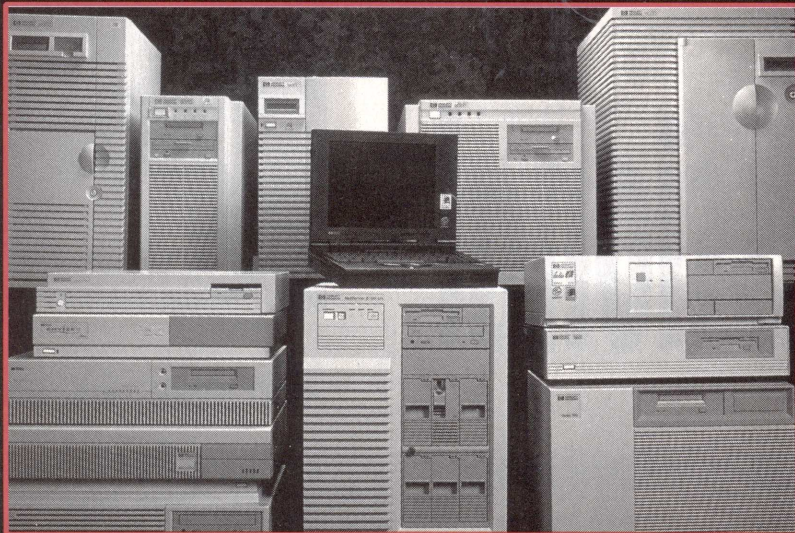
47 Advertiser Index

48 HP New Products

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ABP



All For One And One For Two

I have a deep-rooted fear of the status quo. Anyone who knows me well, knows that I cringe when someone tells me, "that's the way its always been done." Lately, I've been wondering if Lew Platt and HP's Board of Directors don't share my fear.

I can't help but think they must have been looking for a way to shake up the HP status quo when they decided to split HP into two not so equal (from a revenue perspective) parts. You have to admit: Expected or not, it was a rather unpredictable move. After all, as a friend who's a finance manager for a large multinational company told me, "companies usually combine to take advantage of synergies, not separate." So much for conventional wisdom.

SPLITS HAPPEN

Mr. Platt, who is well known around HP for cigarette breaks and reorganizations, has taken responsibility for the HP1 and HP2 idea. There have been at least seven reorgs of HP's computer organization during his six-year tenure as head HP honcho. Three of them in the past several months alone (no one has counted the number of cigarette breaks). So, clearly, Mr. Platt would rather err on the side of changing the status quo.

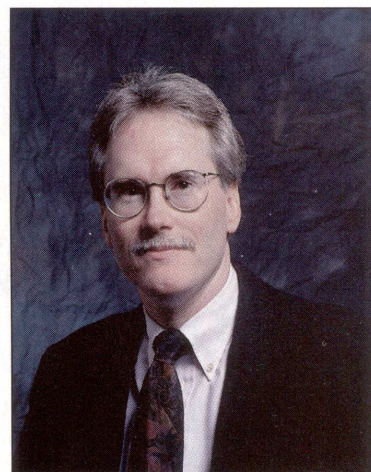
Hypercritics perceive the split as a shallow maneuver at appeasing Wall Street stock jocks. I see it as a dramatic, but nevertheless, necessary public symbol that HP means to change its (I just can't resist) HP Way(s). If you're like me, you've worked in companies that stuck by the status quo. Sooner or later, they have it stuck to them. Even those less severe in their faultfinding are making comparisons between HP post-split and Digital Equipment pre-Compaq. Well, I can tell you that HP is hardly in that kind of turmoil. But like Digital then, HP now, may have focused too far beyond the needs of its installed base. And I'm sure the HP execs know that it's less expensive in the long-term to keep a satisfied customer than it is to win new ones.

MULTIPLICITY

Apparently, HP has simply become a victim of its own foolish consistency. Or as HP spokesperson, Deborah Dunn pointed out to me, Mr. Platt's split decision sacrifices synergy for focus. There's no doubt that the idea of a cadre of engineers sharing great ideas about measurement, computers and communications between work benches served HP quite well for 60 years. But the status could not stay quo any longer. Indeed, the relationships between the two HP's will still exist, according to Dunn, but will be "more formalized."

However, the computer and imaging company that is now called Hewlett-Packard (and the one that this magazine is primarily concerned with) accounted for 85% of HP's fiscal 1998 revenue, still has several more distinct HP businesses within it. On the server side, there are the PA-RISC-based HP 3000 and the HP 9000 and the Intel-based NetServers. On the desktop side, there are HP 9000 and Kayak workstations as well as HP Vectras and Brios and OmniBook laptops, not to mention HP's Jornada handheld, plus HP Pavillion PCs for the home. Add to that the storage information business. And I'm just getting warmed up.

Let's not forget HP OpenView, the leading network management software. While we're at it, let's not dis HP VirtualVault, Authorization Server and DomainGuard software. Next, pile on Web QoS and ChangeEngine software, already in the second and third versions respectively. Oh yeah, did I mention printers? And didn't I leave out scanners and multi-function machines? Before we leave this not even close to exhaustive list, let's add HP Consulting. They eat, sleep, and drink this stuff too, you know.



Has HP
become a
victim of its
own foolish
consistency?

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HOCUS POCUS OR RE-FOCUS?

Trading synergy for focus starts to make sense, doesn't it? A deep cleansing breath was taken in the form of the new Enterprise Computing Solutions Organization (ECSO) that has finally brought all of HP's formerly decentralized hardware, software and services business units and divisions into one box on the org chart. That one box is now one company. However, it seems to me that HP needs to get beyond organizing by product, platform or technology. And start sorting out what it wants to focus on: Services? Distribution? Marketing? Customer segments?

HP needs to stop "giving the customers what they want" and start getting back to giving the customers what they need. That is, bring all HP technologies and services to bear on specific customer experiences. The good news is that HP has finally begun addressing some of those problems with a long overdue overhaul of its channel strategy (see my interview with Vikram Metha in this issue).

Of course, it's too early to predict whether two HPs are better than one. We have to wait until next year to see if HP can not only streamline its strategic focus, but execute it. The value of HP has always been invested in the belief that HP's whole was greater than the sum of its parts. Until recently, that was good enough to get HP to \$47 billion dollars in revenue. Besides Andy Grove, only Bill Gates may be more paranoid than Mr. Platt right now.

• • •

THE FACE OF CHANGE

Speaking of changes, you may have noticed that there are more than a few differences in *HP Professional* these days. First, we've added shorter lead stories to complement an in-depth cover story each month. And we've redesigned the entire magazine to make it easier to review and sort out what's important to you.

We've renamed our columns to reflect our coverage of HP-UX, Intel-based systems and added a new reseller column called Channelling. And we've added a new section appropriately called *Outside the Box* to not only examine the business of IT, but to question conventional IT wisdom.

Last, but certainly not least, we've changed our tag line. We are now "The Independent Guide to Integrating Hewlett-Packard Systems In Your Enterprise." That's now our focus as well as a promise. So, as we all move forward in a HP sort of way, tell me about your IT successes or failures in your brave new IT environments. What products, services or technologies would you like us to cover in more (or less) depth? What kinds of information are you still lacking? What keeps you up at night? Send your comments, kudos or complaints to me at thompsona@hppro.com.



George A. Thompson
thompsona@hppro.com

mail bonding

I thoroughly enjoyed the "Ignite" piece in your [HP-UX Admin Man] column. I work for a Dept. of Defense system integrator and we recommend Ignite be used locally for creating bootable backup tapes. There are security restrictions on the "remote" control of servers for our customer, so I don't see a way to use Ignite features for our application (this gov't customer doesn't want the opportunity for someone to use an "install" attack on their machines). If you can,

I would like to see information in your column on the following topics:

Security — is there a way to alleviate the concerns of an extremely security conscious customer with regard to Ignite?

Bootable CD-ROMs — we master our own CD-ROMs. Can we use Ignite to help boot the customers systems and load our products from a CD-ROM? Tapes are pretty simple, but I couldn't locate a clear-cut way to build CD-ROM images (in that the

boot image is "first" on the tape, where do we put it on a CD-ROM?)

Our customer is not very Unix literate and we would like to be able to control the entire boot/install process (we also have to do things like rebuild the Kernel with updated parameter values).

Jeffrey L. Cooke
Lockheed Martin Federal Systems

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Inside IT

Closing In On Mainstream Apps

Is Open Source Software An Idea Whose Future Is Now?

After more than 20 years, the movement towards open source software has become a rising tide.

Rather than trying to stop the tide from coming in, the likes of HP, IBM, Oracle and SAP are learning to swim with the answer to this question: "Is mainstream acceptance of the open source concept an idea whose time has come?"

"I want to live in a world where software doesn't suck," says Eric Raymond, president of the Open Source Initiative. "The main concept of open source is peer review.

Lots and lots of people looking at the code." The goal, he adds, is to make that case to the commercial software development world. "I'm the guy who says the emperor doesn't have any clothes."

MANIFEST DICHOTOMY

The dichotomy between the open source concept and conventional development is summed up in Raymond's manifesto "The Cathedral and the Bazaar." In it, he compares the traditional process of building software to that of building great cathedrals that are, "... carefully crafted by individual wizards or small bands of mages working in splendid

isolation, with no beta to be released before its time."

Contrast that to the free-wheeling nature of an open-air marketplace: "... the Linux community seemed to resemble a great babbling bazaar of differing agendas and approaches (aptly symbolized by the Linux archive sites, who'd take submissions from *anyone*). The Linux world not only didn't fly apart in confusion but seemed to go from strength to strength at a speed barely imaginable to cathedral-builders."

While Linux may be, according to Raymond, "the star performer we're using to advance our

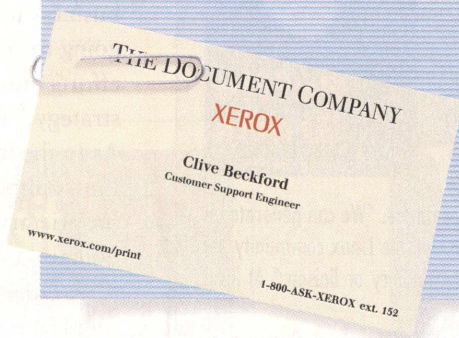
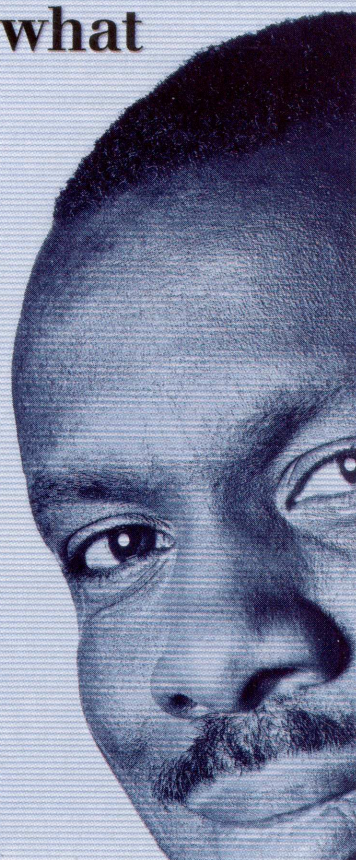
case," it's by no means the only innovation that can be credited to open source adherents over the last 20 plus years. Raymond points to the Apache Web server, (calling it the "core software of the Internet"), DNS, Internet Bind libraries, Perl and sendmail as examples of what true believers have created and freely modified. "Linux is just an example, not the be all and end all. People shouldn't see it as the only story out there."

AN OPEN AND SHUT CASE

While the case for open source is easy to make for individual developers and end users, for conventional ISVs it may not be so

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apparent. But, Raymond says the open-source model has a lot to offer the business world. "It's a way to build open standards as actual software, ... a way that many companies and individuals can collaborate on a product that none of them could achieve alone. It's the rapid bug-fixes and changes that the user asks for, done to the user's own schedule. [It] also means increased security: Because code is in the public view it will be exposed to extreme scrutiny, with problems found and fixed instead of kept secret until the wrong person discovers them."

From an investor's point of view, he touts four different business models for making money

with open source:

•**Support Sellers**

Effectively giving away the software product, but selling distribution, branding and after-sale service similar to what RedHat and Cygnus do

•**Loss Leader**

Giving away open-source as a loss-leader and market positioner for closed software similar to what Netscape does

•**Widget Frosting**

A hardware company for which software is a necessary adjunct but strictly a cost rather than profit center, goes open-source in order to get better drivers and interface tools cheaper

•**Accessorizing**

Selling accessories like books, compatible hard-

ware, complete systems with open-source software pre-installed. Books and hardware underlie some clear successes: O'Reilly Associates, SSC, and VA Research.

If heavyweight endorsements are any indication of an idea or product's entry into IT prime time, then open source and in particular, Linux's time has arrived. The most significant conversion to date has certainly been IBM, says Raymond. With DB2, already available in a Linux flavor and a February, 1999 agreement with Red Hat to run its Linux on IBM personal

systems, Big Blue is committed to push open source across its product line.

Add to that HP's announced alliance with open source programmers to port Linux to run on PA-RISC (see *HP Lines Up Linux For PA-RISC* sidebar) and its creation of the Open Source Support Organization (OSSO) as part of the E-Services division. "Linux is definitely for real," says Wayne Caccamo, HP's director of the OSSO. "It's going to play a major role in HP's strategic markets for ISPs, Web and e-mail servers and firewall proxies."

HP AS VOICE OF THE PEOPLE?

The purpose of HP's OSSO is to coordinate and evolve a common open source voice across all system and software services business units. "We're going to combine all our efforts into a cohesive strategy," says Caccamo. As to the inclusion of Linux into what has been a proprietary HP-UX domain, Caccamo adds that, rather than undercutting HP-UX, the endorsement of Linux adds another tool for e-commerce developers. "It's very easy to develop on Linux and deploy on HP-UX."

The two operating systems will be further linked by support of APIs and tool sets such as Cygnus' Tool Chain. According to Caccamo, "Common APIs and common tools are a growing funnel for future HP-UX deployment."

HP Lines Up Linux For PA-RISC

On March 1, 1999 HP announced that it will enlist the support of the open source development community in porting Linux to run on its PA-RISC platform. That support will take the form of The Puffin Group (Ottawa, Ont., Can.).

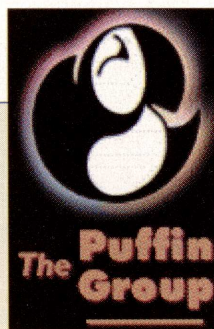
Named for a cousin of the Linux mascot, the penguin, The Puffin Group currently consists of three people in the core group with an active mailing list of over 150 programmers. "We can generate an incredible response from the development community. Our goal is to help corporations and the Linux community get together," says Christopher Beard, president of The Puffin Group. "We act as an intermediary or liaison." At least one dozen programmers have expressed interest in the PA-RISC port project.

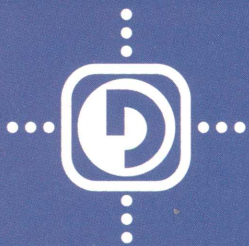
Beard and several of his Linux cohorts started the port of Linux to PA-RISC before HP was involved. Once people got wind of his efforts, HP offered to supply equipment, technical consultants and other help as needed. "HP and the open source developers had different motivations but the same goals," he says. "That's why the relationship works." Beard adds that he expects to be through with the kernel development within a year and he may have people polishing and enhancing the kernel concurrently.

Noting that the firm is still in an embryonic business state, Beard describes himself as a non-traditionalist and the company as "a group of passionate open-source developers ... with considerable experience in all aspects of Linux." He adds that Puffin's developers all maintain other full time jobs but volunteer their time to the group's efforts. "The developers are in it for the experience and challenge, but they still have to generate revenue streams. They work on other projects to pay the bills."

Beard himself has been a senior analyst with the Canadian government for over two years and is currently working on projects that use only Linux. He has worked with UNIX for over 10 years, Linux since 1992 and Linux exclusively for the last three years. "For a lot of my projects, NT and UNIX are not adequate."

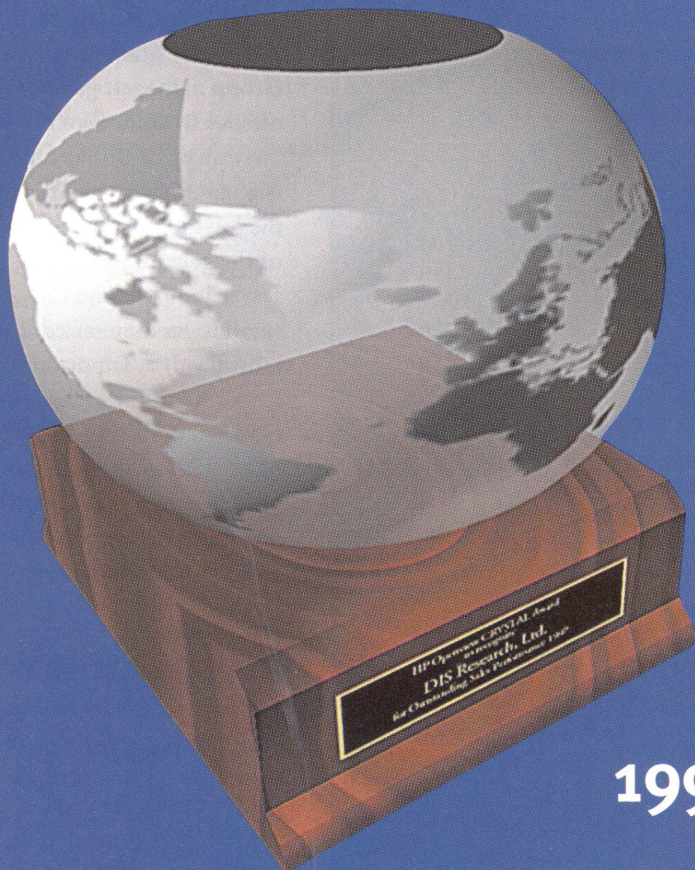
— K.D.





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But, as popular and sturdy as Linux has become, it may not be appropriate in all situations, he adds. "There may be some things that Linux can't handle, like failover clusters, where it makes more sense for us to push HP-UX. Like in classic data center environments."

Finally, and perhaps most revealing about HP's future plans, Caccamo says that everything in HP's software product line is being evaluated for possible porting to Linux. He adds that OpenMail is currently in testing and should be Linux-ready in the near future and with Network Node Manager (NNM) already able to manage Linux clients, a Linux-based NNM console is "being looked at."

MAYBE MICROSOFT?

Of course the Redmondians are paying close attention to the possible long-term effects of the open model. This past October, Raymond came into possession of several confidential internal Microsoft memos written by Vinod Valloppillil, a Microsoft engineer. Dubbed "The Halloween Papers," they start by stating, "[Open Source Software] poses a direct, short-term revenue and platform threat to Microsoft — particularly in the server space. Additionally, the intrinsic parallelism and free idea exchange in OSS has benefits that are not replicable

with our current licensing model and therefore present a long-term developer mindshare threat."

Finding ways for Microsoft strategists to fight the movement may be

memo adds, "to understand how to compete against OSS, we must target a process rather than a company."

Microsoft, in a posting to their Web site dated

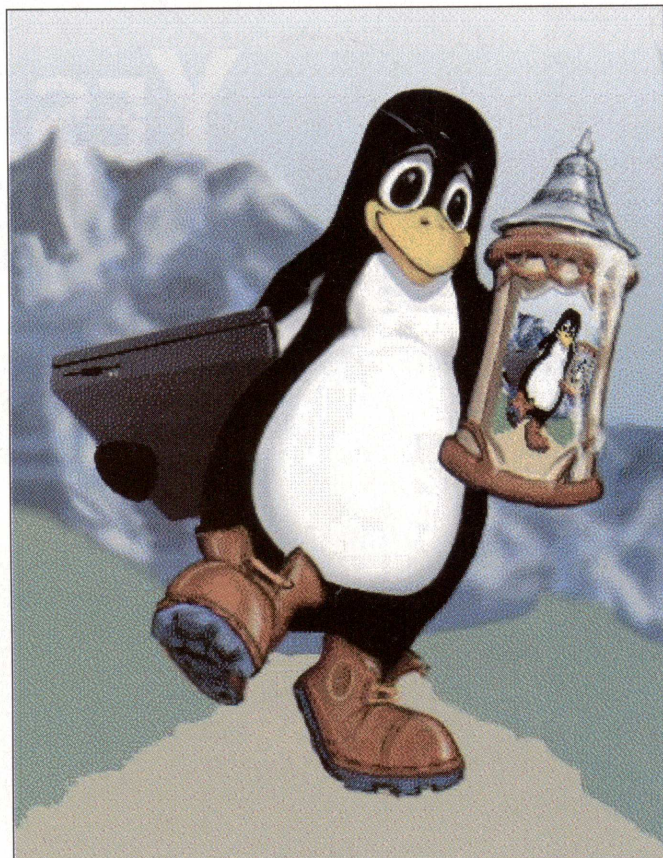
tant to note that these memos represent an engineer's individual assessment of the market at one point in time. [They] are not an official statement by Microsoft."

Ed Muth, Microsoft's Enterprise Marketing Group manager, gave the official Redmondian reply: "My analysis is that Linux is a material competitor in the lower-performance end of the general purpose server industry and the small to medium-sized ISP industry. It is important to recognize that Linux, beyond competing with Microsoft, is also and perhaps even more frequently, an alternative or competitor to other versions of UNIX."

LOOK LIKE, SOUNDS LIKE

To many in the commercial world of big-business software, the open source movement looks like a radical change in the ways of doing business. To the movement's strongest advocates, the radical change is in advancing a moral argument that end users are entitled to the best products they can find and the only way to improve end products is to offer the source code for open review and thereby improve engineering outcomes. Says Raymond, "If we can't improve the software, then we don't deserve to win the moral argument."

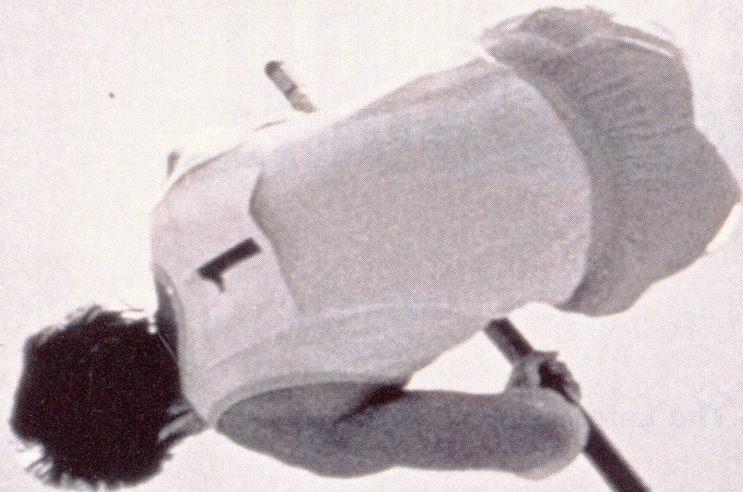
—Ken Deats,
Associate Editor



The Linux Beer Hike (a.k.a. "LBW") is a week-long trip scheduled for August 7 - 14, 1999 in which Linux users will hike the hills and caves of North Eastern Bavaria to learn Linux on their laptop computers by day and visit the local brewpubs by night. Check electriclien.com/linuxbierwanderung/ for more details. Maybe they'll come back with Linux on PA-RISC.

forcing new definitions of just what it's fighting. For a company steeped in the traditional one-on-one style of combat between companies, open source's loosely defined, amorphous format will force a rethinking of Microsoft's competitive nature. The

November, 5 1998, answered, "[the memos] were intended to stimulate internal discussion on the open source model and the operating system industry. The practice of researching and assessing competitors is standard procedure at the company ... It's impor-



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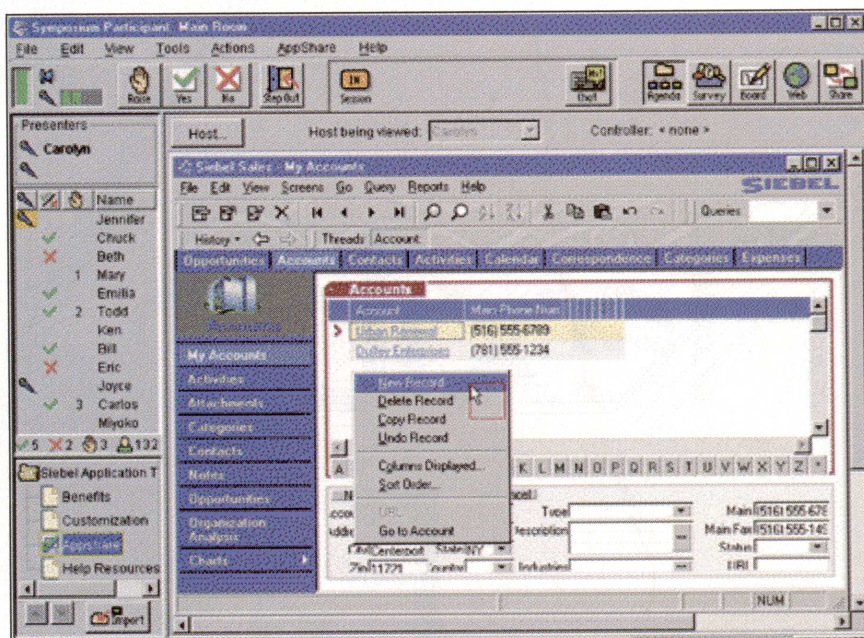
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High Tech High Touch In Action

Using The Latest Technology To Teach The Latest Technology.

IT'S A COMMON QUANDARY as technology becomes more complex and harder to master, training and travel budgets seem to be shrinking. So how does a company that depends on a knowledgeable workforce and as knowledgeable a customer base use IT to overcome that dilemma? Click for a virtual classroom.



Ken Deats

Centra Software, Inc. (Lexington, Mass.) is a provider of Web-based training and collaboration systems. Their flagship product, *Symposium*, provides live, multi-point voice over IP and an application sharing capability that delivers training over the Internet or an intranet. Founded in 1995 and only two years since the release of *Symposium*, Centra's customer and partner's list reads like a 'Who's Who?' of technology providers and integrators. It includes Baan, Nortel Networks, Hitachi Data Systems, Oracle, and Kronos.

Not surprisingly, says Allen May, Centra's director of Partner Programs, technology firms were the first to integrate the concept of collaborative Web-based training and certification into their offerings. "Their consultants can't be pulled out of the field where their hours are billable," he says. "They have to build their skills without interrupting their normal work."

He points to Pricewaterhouse Coopers (PWC), a Centra Premier Partner, as a typical example. One of the world's largest consulting firms and system integrators, PWC has incorporated *Symposium* into its application deployment methodology and the delivery of live interactive, end-user training, support, implemen-

tation and consulting services as part of its deployment of products such as SAP, Peoplesoft, Oracle and Siebel.

"*Symposium* is the enabling technology for [PWC] to deliver change management and training to their customers and internal consultants," says May. "[Along with] instructor led training complemented with *Symposium*, they're using it for hundreds of thousands of people."

Centra claims that *Symposium* is the only live Internet collaboration software to offer fully integrated, multi-way audio conferencing as a standard feature accessible to all users on a LAN, Internet, or low bandwidth dial-up connection. "We realized early on that we would need to have control over all the types of con-

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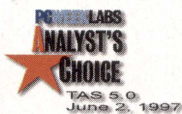
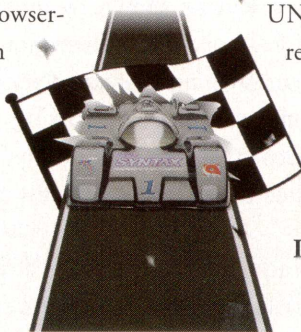
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tent we could deliver, including audio, video and application sharing data streams," says Michael Hackney, Centra's CTO. "Other products maintain different data streams for each source which leads to problems of synchronization and number of ports."

SYMPOSIUM SKELETON

Symposium makes use of Windows multimedia APIs to capture the audio stream then uses compression technology from Voxware, Inc. (Princeton, N.J.) in a process Hackney describes as, "optimizing bandwidth by taking the pauses out. We wrap it up in a high-performance proprietary protocol, wrap that in TCP/IP and end up using 7.5kbps of bandwidth per client." The combined data stream travels on what Hackney calls the Symposium Backbone. That high-compression algorithm allows for a connection as slow as a 28.8kbps dial-up.

In March, Centra announced its *Centra '99* product, which adds event templates and new toolkits to the *Symposium* foundation. Hackney highlights the addition of open architecture support for HTTP, HTML, TCP/IP, XML, IMS, ODBC/JDBC and gateway services for LDAP that will offer integration with Microsoft, Oracle and other standard database products.

Centra '99 templates include: **Sales** for 1-to-1 and group sales training; **Marketing** for large-scale events; **Training and Education** to augment classrooms with hands-on technical and certification training; **Channel** to enable product training for resellers; and **Service** to support mobile and remote service personnel.

May adds that Centra soon will be offering Web-hosting services for training. "Customers who don't want to invest in the overall training infrastructure will be able to do one-stop-shopping. They will be able to purchase *Symposium* with an outsourcing option and offload the burden." ♦

THE CERTAINTY OF CERTIFICATION

The goal of *HP Education* is to create a high level of technical competency by offering programs that include both HP-UX and HP Information Technology Service Management (ITSM)/OpenView certification tracks.

Jamie Mulkey, HP Education's Worldwide Certification Program manager, attributes the recent rise in the popularity of certification programs to Microsoft's many product training offerings. But, she differentiates HP's certification program from Microsoft's by emphasizing the concentration of lab and lecture times involved. In HP's practice labs, students and teachers can interact with each other and solve problems as a group by way of shared-screen technology. The typical HP certification, she says, will take as many as three classes over 15 days. She adds that with the recommended three to six months of real-life experience between classes, to become HP Certified may take as much as 18 months.

"Microsoft focuses on passing tests," she adds. "In six to eight weeks you can become a [Microsoft Certified Systems Engineer]. *HP Certification* is the first OpenView certification program specifically for HP customers that's based on specific skills. We're focusing on technical tasks, not on other aspects of their whole job like project management or people skills."

The program's philosophy, says Mulkey, is that employers have to be able to derive improved service quality, increased user satisfaction through enhanced technical support, greater staff productivity, heightened staff quality, lower operating costs and improved company reputation. Employees, on the other hand, will have faster career advancement, greater technical credibility, greater job satisfaction, better problem-solving skills, and ultimately, potential for higher pay and marketability.

The *HP Certified* program is constructed in two tiers: the *HP Certified IT Professional* and *HP Certified Advanced IT Professional*. The first tier deals with job-relevant skills that are matched by HP's core curriculum for HP-UX and ITSM/OpenView. Mulkey says that the second tier requires deeper, proven skills as shown by mastering complex tasks in special areas, such as High Availability, Operations, Performance and Capacity Management and customizing Network Node Manager in a multi-vendor environment. Both tiers require the passing of detailed tests: The *IT Professional* track includes a written exam only, while the *Advanced IT Professional* track includes a workshop and test comprised of written and hands-on components.

In addition, Mulkey says that practice tests are available for students to assess their readiness for true certification testing and that a program of knowledge maintenance will be offered for those who have finished their program. "We're implementing a continuing education model," she says. "To help keep their knowledge up to date, rather than re-test, we want to offer additional courses."

— K.D.



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Integration From The Ground Up

HP, Oracle And KPMG Take Flight To Guide Canada's Air Traffic.

IN 1996, TRANSPORT Canada, transferred its Air Navigation Services to NAV CANADA. But the development of IT and business systems was difficult. "New employees" would not officially begin until they were transferred in September 1997 from Transport Canada. Enter KPMG International.

John Richer

Located in Ottawa, Ontario NAV CANADA adopted the air traffic control, flight information, weather briefings, airport advisory services and electronic aids to navigation from Transport Canada on November 1, 1996. Plans to implement the transfer began in March 1996 with a startup date initially scheduled for July. That afforded NAV CANADA's executives a few months to set up their company from scratch.

In its move from government to private sector, NAV CANADA had to implement a new payroll, human



resources information and financial management systems to reflect private sector practices. And under the transfer guidelines, NAV CANADA was to fund its services solely through user fees charged to airlines and aircraft operators.

Consequently, the company also had to introduce and phase-in user fees for its Air Navigation Services (ANS). This required new sets of procedures and systems for customer billing, revenue accounting and credit and collection of domestic and international user charges.

SAFETY FIRST

The company's new operating structure was developed to ensure that the country's ANS would be better posi-

tioned to respond to the needs of users on a number of fronts, including training, new investment in technology, overall quality and efficiency. To ensure that safety was a part of the initial planning, an emphasis was placed on having intelligent systems for decision-support, financial/accounting and business information.

Making the transition from a government department to a private-sector corporation with minimum disruption and constant attention to passenger safety was a challenge because it involved both information systems as well as employees; especially "new" employees who would not officially transfer from Transport Canada until September 1997.

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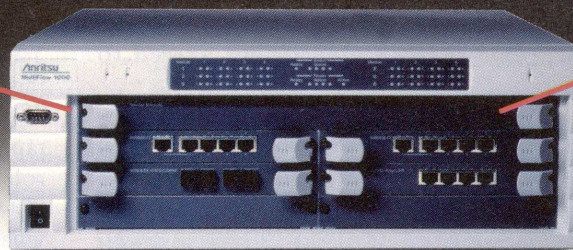
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Consequently, during the six months prior to startup on November 1, 1996 their knowledge base was not readily available.

So, KPMG International, hired to fill the void, managed the project and provided direction and resources for developing new business systems for NAV CANADA. Acting as the systems integrator, 20 KPMG consultants collaborated with an executive committee from NAV CANADA and a small transition team from Transport Canada.

CLEARED FOR TAKEOFF

The first phase of integration was the resource management system. "This system included the general ledger, accounts payable and purchasing areas of finance; a temporary human resources system; a wide-area network; electronic mail; records management; asset management; desktop infrastructure; user support organiza-

tion and operational support organization," says Kathleen Byrne, VP of Enabling Technologies at KPMG. "For NAV CANADA, this early step established an all-important basis for sound decision-making thereafter."

At the heart of the company's first phase was the finance/human resources application suite. First, however, KPMG and the executive committee had to decide what management application system to run and what platform to use. While Transport Canada had run Oracle Applications in a Digital VMS environment, managers at both companies calculated that converting data from a legacy system was not feasible in the time allowed for implementation.

The technical- and financial-department personnel that would eventually transfer to NAV CANADA were already proficient with Oracle's architecture. Also, as part of the deal, the federal government agreed to

transfer certain license agreements to NAV CANADA. So, continuing with Oracle Applications proved to be the logical choice.

The next step was choosing a platform. To continue paying the cost of supporting a mainframe-based operation was deemed unfeasible in the new pay-as-you-go environment, so consideration was given to mid-tier UNIX platforms and a client-server architecture. HP was eventually chosen because of capability, reliability, strength and price.

MIGRATION DEDICATION

A HP 9000, Model T520 was initially dedicated to production, a K200 was dedicated to production support and a K450 was purchased for disaster recovery. After the first migration to a new version of Oracle, NAV CANADA chose to switch to a T-Class server for disaster recovery purposes and Y2K, moving production processes to the Model K450.

KPMG and NAV CANADA also tapped HP sales engineering to play a role in capacity planning. "We told HP what we were planning to run and what our volumetrics were. Then we asked what size machines were needed," explained Don Kelly, National Operations manager. "They came back with a platform configuration and after a close look at their recommendation, we agreed that it was the right design. This extra step provided an added measure of confidence for safeguarding NAV CANADA's business processes."

"You have to remember that a hallmark of this transition to private enterprise was that the legislation afforded our teams with an extremely small window in which to develop systems supporting internal NAV CANADA processes as well as the framework for flight information and air navigation services. Six months — that was [it]," says John Crichton, NAV CANADA President and CEO.

So, NAV CANADA and KPMG's teams promoted the concept of "keep it simple and test, test and test again." The idea was to encourage a rapid

ADAPT OR DIE

After working with a highly customized version of Oracle 9.42 at Transport Canada, the executive committee made a strategic decision *not to customize* the Oracle product to the processes of the new company. Instead, they *would adapt or customize their processes to the product*. Though this required the finance people to re-think procedures and make several process changes, it also gave NAV CANADA the capability to grow with its customers' demands and keep pace with technology advancements.

For example, during the two years that followed, NAV CANADA streamlined migrations from Oracle 10.5 to version 10.7. The first migration in the Spring of 1997 was a move to version 10.6 to add the Oracle Human Resources module. Version 10.7, introduced in April, 1998, supported the startup of Accounts Receivable and Y2K practices. The only major customization to the Oracle product was to make it bilingual.

With the migration to Oracle 10.7, NAV CANADA was well on its way to being Y2K-compliant. Renovations on all systems intended for use after December 31, 1999 were completed by October 31, 1998. Individual systems were to be certified by December 31, 1998 with end-to-end testing completed by April 30, 1999. Enterprise-wide compliance is expected by April 30, 1999.

— J.R.

a hallmark of this transition to private enterprise was that the legislation afforded our teams with an extremely small window in which to develop systems. So, NAV CANADA and KPMG's teams promoted the concept of "keep it simple and test, test and test again."

implementation of a system that was exceptionally stable and reliable.

That philosophy helped to ensure an effective transfer of system operations such as configuration control and testing regimens from KPMG into the hands of NAV CANADA's company users in November. The team focused on putting in the application with no customizations, even changing and readapting company practices in a few cases, followed by very thorough testing. "Keeping things simple in this fashion also allowed substantial flexibility for NAV CANADA's requirements and this proved to be extremely beneficial in the long term," notes Byrne.

SHARING THE AIR

The company is now sharing its knowledge with other air navigation service providers and organizations around the world. Regarding the Y2K readiness of common air navigation infrastructures, this includes the United States, the United Kingdom, Portugal, Iceland and others.

Oracle and the database applications suite supported and simplified the consolidation or integration of systems for inventory, asset management, accounts receivable and human resources. As such, KPMG integrators created a consistent data architecture for NAV CANADA to use as the basis for driving its technology across the company, even as the market for its services expanded by more than 5%.

As data is generated, it must be accessible from many locations. For example, model budgets are created

using the Oracles Financial Analyzer (OFA), a multi-dimensional, cubic database. Once created, they're automatically linked to the financial management system for access by other users and company executives. Managers throughout the company can then create, manipulate and refine their own budgets. When each is finished, it automatically becomes part of the company's general ledger without imposing additional steps or delay, a process that gains productivity savings.

If managers need to model their expenditures against a new or proposed budget, OFA links back into the general ledger, extracts actual figures and allows managers to model what they anticipate spending against what they have previously spent. In a diverse application world, that action ordinarily takes weeks, but at NAV CANADA it takes only a few hours.

The information team also coordinates various system resources, such as the training and testing environments and a production support environment which are also operated on HP 9000 Series D- and K-Class servers. Because NAV CANADA is running a highly integrated system, different company communities, ranging from asset management and revenue management to financial reporting and human resources, are interested in using these resources. "Combined with rigorous testing procedures, they're benefiting from an extremely stable production environment," noted Byrne (see *Guarding Against Future Shock* sidebar).

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safety and efficiency are complementary has helped secure NAV CANADA's success. The company does not focus on profit making *per se*, rather concentrating on efficient and technologically sound operations to back up equally safe and effective air navigation services. Canadian air traffic may well exceed the 5% levels that the rest of the world anticipates and undoubtedly puts pressure on the capacity of the ANS.

It's a tremendous impetus for the innovative use of technologies and techniques to accommodate our customers and the traveling public. Most recently, NAV CANADA has extended the benefits of its financial systems directly to its users. For example, pilots or airline controllers can work from NAV CANADA's Web site and use our Enroute and Terminal Fee Calculator to estimate movement-based charges — navigation services between geographic waypoints.

DOWN TO BUSINESS

Management's intent with the financial applications is not only to help planes navigate safely, but to ensure the reliability and capability of the minute-by-minute business data processes of NAV CANADA and to make that data available to users on the company network at several hundred sites across Canada. This should succeed even as aircraft operations change and data grows more complex. Currently, NAV CANADA supports nearly 800 accounts and 220-250 concurrent daily users spread from as far as Gander, Newfoundland in the East to Vancouver, British Columbia in the West.

During its first two years of operation, NAV CANADA invested more than \$165 million in a program geared to improve safety and technology. "Safety in the skies is our first priority and it's our only product," says Crichton in a recent press release. "Our not-for-profit mandate and our stakeholder-based structure, with Transport Canada acting as safety regulator, is a vast improvement on the old model in which the safety reg-

GUARDING AGAINST FUTURE SHOCK

To ensure that things remain simple, NAV CANADA implemented a Configuration Management Board, which is a multi-disciplinary group that meets weekly to review all systems and share information with one another. NAV CANADA also formalized a new direction called "Shaping the Future." Besides integrating and automating processes, "Shaping the Future" is designed to target opportunities such as reducing operating expenses, which it did by \$90 million. It also equips smaller staffing levels of management, general and administrative staff to effectively continue to support operational needs while bringing the company in line with private sector practices.

Testing is an invaluable element of the process for NAV CANADA. The company uses six of its 19 servers, ranging from HP 9000 D370s to K400s, to support application testing processes and development models. In a busy week, the Configuration Management Board may address as many as four or five minor change requests from users. Minimizing problems is seen as a direct result of the rigorous testing done before anything reaches production. There are virtually no problems with the production system and this success is seen as the direct result of that testing on each change request.

For example, when NAV CANADA is ready to upgrade to future product releases from Oracle, we'll most likely replicate the present environment and then upgrade to the new version. That new version will then be put in different environments so that the main finance support staff can have a look and make any suggestions for changes as they see fit. The process will be the same for human resources and other areas. In the end, there may be four or five copies of the upgraded version running. These will allow each functional group to run their own tests independently. Eventually, these instances will be consolidated into a final test environment to test modular interaction. Once everyone approves, the team will migrate each group to production services.

— J.R.

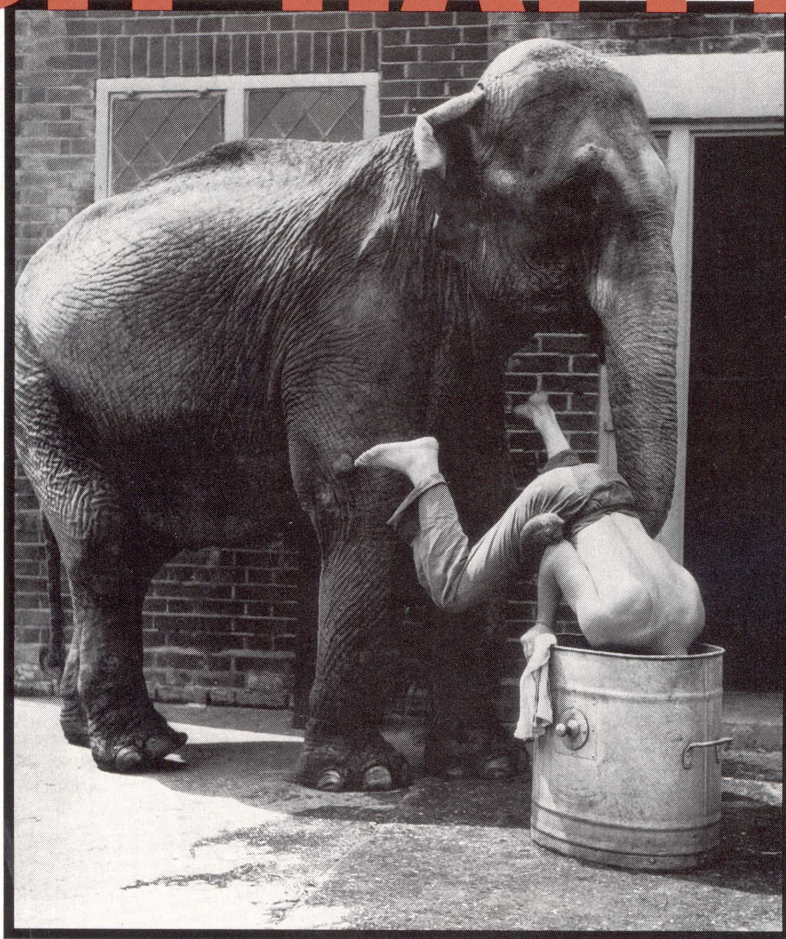
ulator and provider were part of the same government department."

In this new business model, customers and investors are the same. This means that commercial and airline pilots sitting in an aircraft cockpit as customers are also sitting on the Board of Directors. During its first two years, NAV CANADA was able to operate Canada's ANS at less cost and with greater efficiency than achieved under direct government control. More importantly, because

its user fee system is more broad-based than the old tax and its overhead costs are lower, NAV CANADA expects to save airlines operating to, from and within Canada more than \$125 million in the year that began March 1, 1999.

John Richer is NAV CANADA's Manager Service Delivery for ERP Systems.

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A CONVERSATION WITH VIKRAM METHA

U.S. Marketing Manager for the Enterprise Systems Group

George A. Thompson

THIS CHANNEL. AND THAT CHANNEL. There's been a lot of chatter in the channel about HP's channel strategy. HP's distributors and resellers have been restless the past few years with what they feel is often a byzantine process for getting the goods from HP. So, what's happening with HP's channel?

Well, "We're starting with a clean slate," says Vikram Metha, HP's new channel chief for HP's Enterprise System Group (ESG). Just prior to replacing Vince Cavell, who has since defected to Client Systems, a HP 3000 distributor, you could have found Metha performing similar duties as Marketing Manager for HP's Asia-Pacific region. Metha is the man behind HP's new "All Channels Strategy."

In order to keep the competition from cleaning HP channel's clock, Metha is starting with a couple of brutally honest observations about HP's org chart and policies: "Up until now, the direct sales force was headed up by one VP and the indirect sales force was headed up by one VP. Every time you have those kind of 'siloe'd organizations,' it all becomes an internal battle about having all the business in one area."

Metha also admits that, until recently, HP's "channel-friendly" label was just that — a label. "We never let the resellers into the HP firewall. Never gave them the same training we've given to our sales force, never shared non-disclosure information with them. Now, we're saying that there's no difference between the direct and indirect sales forces."

Besides the direct and indirect sales channel (Metha uses the

HP Pro: How many HP resellers are there?

V.M.: [In North America], we have 1,100 and some odd resellers. About 100 account for 90 some percent of our business.

HP Pro: Worldwide?

V.M.: About 400 in Asia-Pacific. And about 550 in Europe. That does not include our software sales force, which is separate. That includes another 400 to 500 people.

HP Pro: How much business goes through the off-payroll channel?

V.M.: Worldwide, on average, it's about half-and-half. In North America, it's about 54 percent.

HP Pro: How is the "All Channels Strategy" different than the two-tier model?

V.M.: This is a non-linear model. Instead of having the distributor as the go-between HP and the resellers, we're now saying "Hey, Mr. Distributor why don't you come sit on the same side of the table as us and help us solve our demand creation model for the entire market space?" And it's similar in all geographies.

HP Pro: It's my understanding that resellers are moving "upstream" in the channel to take on the role, if not become de facto, system integrators. Is that happening with HP resellers?

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terms on-payroll and off-payroll respectively), he has added what he calls the "cyberchannel.com" and the "utility computing channels" (see the diagram on page 28). Not surprisingly, the cyberchannel uses the Internet "to effectively communicate key messages out to the marketplace," whereas the utility computing channel depends on the concept of "companies setting up timesharing compute facilities over the Internet, so that small- and mid-size enterprises don't have to worry about purchasing and maintaining their computation infrastructure." Metha is proud of the fact that on the demand creation side, "we've lowered our sales and general admin costs by enough to reinvest in 100 more additions to the direct sales force (which now stands at 670 people)."

Demand fulfillment, which over the years has been a persistent problem for HP, hasn't escaped Metha's attention or imagination either. Now he says, he's replacing a web of complexity that strained HP's balance sheet as well as their resellers' and customers' patience with a streamlined process that uses another kind of Web. "What we're trying to do now is set up a virtual factory which allows us to fulfill demand regardless of where it takes place."

And, he adds, "We surround this virtual factory with a consistent Internet Order Management Interface. Why can't we have just one system [that provides] the highest velocity, highest amount of inventory turns, the least amount of wasted inventory and quickest availability to the customer." Metha also notes that he has identified significant savings for "our demand fulfillment machine."

Metha expects the entire solution to be "very modular, so that we can make changes quickly." If Dell Computer springs to mind, there's good reason. "We're trying to achieve with mission-critical, complex systems what Dell has achieved with commodity products. We want to ensure that the customer has a delightful experience in transacting business with HP."

V.M.: Yes. In some spaces. Many of the true value-added resellers are forging alliances with many system integrators. Price Waterhouse does a lot of work in data warehousing and they always have more work on their hands than the number of engineers available. So they're always looking

for areas of expertise that they can contract out to VARs. I think there's a model of co-optition between the resellers and SIs.

HP Pro: Value-added is ultimately subjective. When it comes to added value how do you judge who is

adding it and who isn't?

V.M.: It depends on how we define the metrics, whether its on-payroll or off-payroll. What percentage is coming from new accounts? Customer satisfaction surveys that we do. How are they being able to hold up the margins and profitability of the product?

If you have a reseller that does all business in the installed base, he's always doing the margin and high discount. And you have a poor customer satisfaction rating, its pretty much telling you that they are coming in at the last minute competing only on price and not an indication that they are not in the account; unless there is a transaction. So that's the kind of metrics that we're setting up for our resellers. And our on-payroll channel as well. Because it's just another channel.

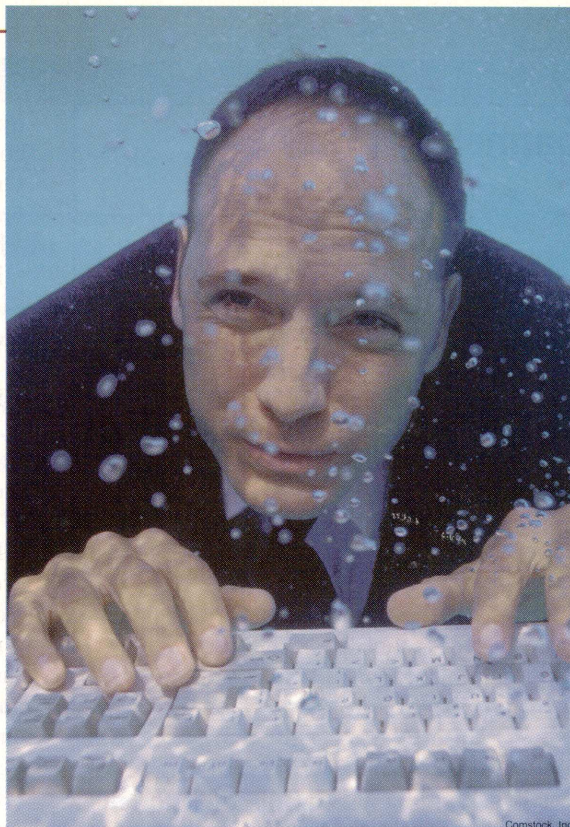
HP Pro: What about the issue of reseller exclusivity?

V.M.: I think we just presumed that if we just signed up more resellers that would automatically increase our business. But as the UNIX business moved onto Main Street, that theory proved to be wrong. So, we felt we were just signing up many resellers [that weren't adding value], but just cannibalizing the business of other resellers. Many of our exclusive resellers started to feel that they were not being recognized.

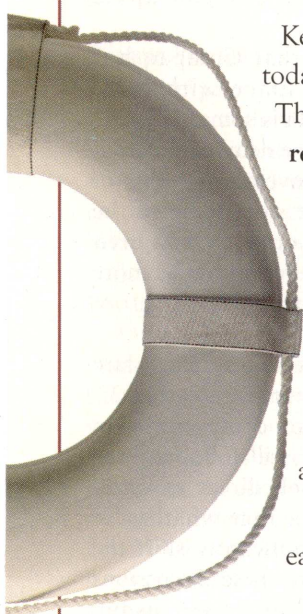
Now, we're saying value add is very important. Because we're going to pay you for the value you add in the process of creating demand. And we're placing very little value on the mundane task of entering a bill of materials into a system. We're telling our resellers: Value. Value. Value.

You have to be value-added. If you're just going to come in and compete at the lowest price with no value-add and slip in at the 11th hour and 59th minute with the lowest quotation, there is no room for you in this program.

If you're in this program and adding value and on top of that — are HP exclusive — we want to do something to recognize you for that. It's only fair. Some of the other partners may still be successful even if HP



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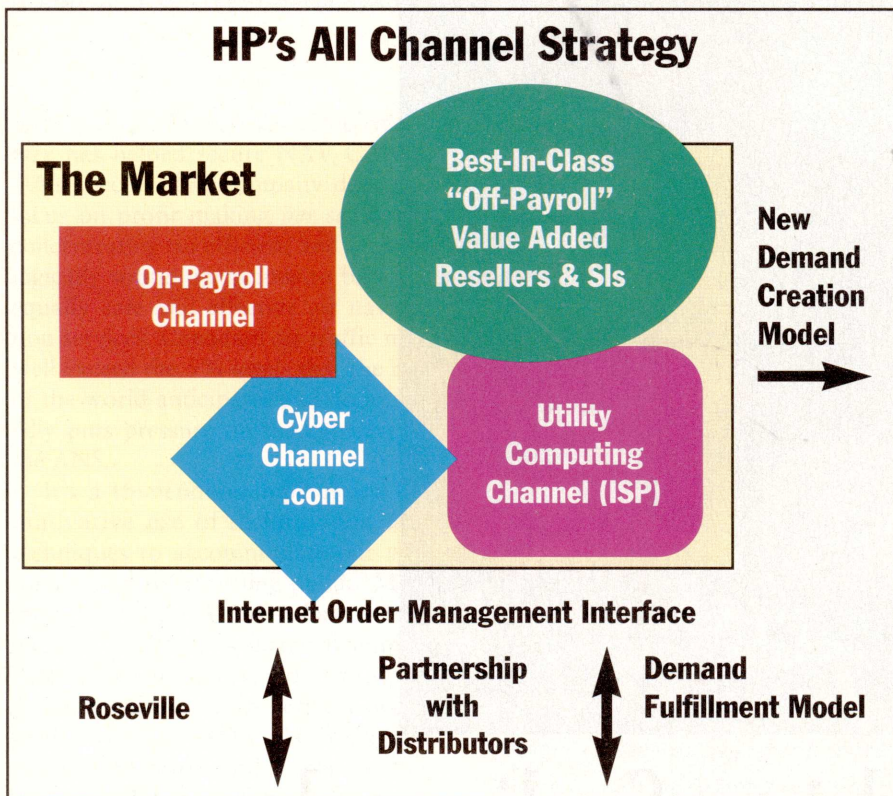
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doesn't win. And we've had some early wins. Many of our exclusive resellers that have actually walked away from us have started to come back exclusive to HP.

HP Pro: You mentioned that reseller and distribution compensation is changing. How?

V.M.: Up until now, we compensated our resellers for getting the purchase order from the customer. We want to shift away from that and say we want to compensate them for creating demand for our products — doing pre-sales, demos, benchmarks, proof-of-concepts, proposals, doing pilots, giving performance guarantees, and doing [things like] capacity planning studies. We're going to compensate our resellers on the work they've done up front and not just on that process of order/entering the bill of materials. And we're going to set up service level agreements with our distributors. For example, we may want [them] to ship from stock or be responsible for final assembly and custom configuration. Or even manage the Internet Order Management interface.

HP Pro: The utility computing or ISP channel as you described it sounds similar to outsourcing.

V.M.: It's different than what CSC or EDS do, which is very large-scale custom outsourcing for big corporations. This is for servicing small and medium enterprise space or niche applications within companies. It's like setting up an electric or telephone utility — you're concerned about that instrument and the functions that that instrument performs.

HP Pro: Can you explain what you mean by the Internet Order Management Interface?

V.M.: Well, why should we have so many different flavors of order management systems? One for Ingram. One for Avnet-HallMark. One for Gates/SBM and for Client Systems. And one for HP.

Whether it's one person searching the net or an on-payroll person that's doing the customer interaction and hence looking after the procurement of the products for the customer or an off-payroll person or an ISP procuring 20 tons of equipment from HP to set

up a huge computing facility. We could run the Internet Management Order Interface ourselves; or we can outsource it to one of our distributors who can be paid, for example, a certain number of cents on every dollar that's transacted through that interface.

HP Pro: Similar to the utility model?

V.M.: Exactly. Sort of applying that utility model to our demand fulfillment engine.

HP Pro: What stage of development are you in?

V.M.: We've been in implementation since November. We're working though the integration of on payroll and off-payroll and utility computing channel into one integrated team.

HP Pro: Do customers have the option of the cyberchannel today?

V.M.: We're setting that up.

HP Pro: As complex configurations become the norm, doesn't training and certification become extremely important?

V.M.: It's of paramount importance.

HP Pro: From a channel's perspective, which company keeps you up at night?

V.M.: The work that Compaq has done in the NT space with their value-added channel is something that I worry about on the demand creation side. And I think, overall, in terms of demand fulfillment side, some of the things that Dell Computer has been able to do. But I think of that as more of a healthy benchmark.

HP Pro: How does your strategy fare against your competitors' programs?

V.M.: Many of our competitors, in many respects, are still following the old channels model: direct vs. indirect. And we think that what we're trying to do is significantly shift the paradigm and make these discussions about indirect and direct [go away]. We want to get all channel types to work in harmony to get us ahead of the competition. That will really break us away from the pack. ♦

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Current State	Waiting	Current Alarms	2	Total Alarms	2
Monitoring Started	2/2/99 4:03:16 PM	Last Scan	2/2/99 4:19:15 PM	Errors	4
Last Alarm Start	2/2/99 4:03:58 PM	Last Page Sent	2/2/99 4:19:43 PM	Page Queue	1
Interval	900	Paging Enabled	True	In Quiet Period	False

Start Monitoring Stop Monitoring Disable Paging Enable Paging Show Activity Log

Object Type	Object ID	Last Alarm Start/End	Status
Event Log	Security on DELL	N/A	OK
Event Log	System on DELL	N/A	OK
NT Service	awh32 on DELL	2/2/99 4:03:58 PM	Please start
NT System	151.198.66.34	N/A	OK
NT System	TECHSERVER	N/A	OK
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Is SECURITY OK on the NT Server? **YES** NO

Is the remote INTERNET site up and running? **YES** NO

Is the REMOTE LOGIN enabled for the network? **YES** **NO**

Are our WEB pages available to our customers? ... **YES** NO

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Clear Log Show Status

INFO	2/2/99 4:21:48 PM	Processing of Notification Requests completed...
INFO	2/2/99 4:21:43 PM	Executing page for awh32 on DELL with C:\Program Files\NightWatch for NT\Alerts\TA
INFO	2/2/99 4:21:43 PM	Processing Notification Requests...
INFO	2/2/99 4:21:06 PM	Status request serviced for 151.198.66.26
INFO	2/2/99 4:20:55 PM	Status request serviced for 151.198.66.35
INFO	2/2/99 4:20:06 PM	Scan complete
INFO	2/2/99 4:20:06 PM	Scanning event log Security on DELL
INFO	2/2/99 4:19:43 PM	Processing of Notification Requests completed...
INFO	2/2/99 4:19:42 PM	Checking https://www.remotesite.com
WARN	2/2/99 4:19:42 PM	NetServerGetInfo failed: (5) Access is denied.
INFO	2/2/99 4:19:39 PM	Checking 151.198.66.34
INFO	2/2/99 4:19:39 PM	Checking TECHSERVER
INFO	2/2/99 4:19:39 PM	Scanning event log System on DELL
ALARM	2/2/99 4:19:38 PM	Please start pcAnywhere
INFO	2/2/99 4:19:38 PM	Checking awh32 on DELL
INFO	2/2/99 4:19:38 PM	Processing Notification Requests...
ALARM	2/2/99 4:19:38 PM	1.1.1.1 Fake Server is Down
INFO	2/2/99 4:19:36 PM	Pinging 1.1.1.1
INFO	2/2/99 4:19:34 PM	Checking http://www.hillary.com
INFO	2/2/99 4:19:34 PM	Get file (FTP) 151.198.66.2:/home/cpl/templfile
WARN	2/2/99 4:19:33 PM	(25722) Operation timed out waiting for response from server
INFO	2/2/99 4:19:16 PM	Get file (FTP) 151.198.66.4:/NIGHTWAT/PUB/difzoff
INFO	2/2/99 4:19:16 PM	Pinging hillary.hillary.com
INFO	2/2/99 4:19:15 PM	Pinging hp3000.hillary.com
INFO	2/2/99 4:19:12 PM	Polling Message Server
INFO	2/2/99 4:19:12 PM	Begin a Scan
INFO	2/2/99 4:06:06 PM	Status request serviced for 151.198.66.26

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Back Through The Middle And Around Again

According to International Data Corp. (IDC; Framingham, Mass) analysts, almost all the major ERP vendors are stretching well beyond the Fortune 1000 and have either launched or announced marketing campaigns that strategically target mid-sized companies. That's because Enterprise Resource Planning (ERP) software solutions, once synonymous with the large enterprises, are coming to the middle market. "The ERP marketplace in the global 500 has become saturated," explains Frank McGorman, channels manager for HP's Internet and application systems division. That means opportunities for HP resellers, system integrators and ERP vendors who can fulfill their needs.

As you might expect, there's also a sizable amount of money to be made. IDC estimates that the worldwide

ERP consulting and integration services market is expected to expand at a compound annual growth rate of 17%, while the client-server segment will grow by more than 25% annually over the next five years. "The ERP vendors want to continue that revenue growth, so they are viewing the mid-market as a large market opportunity," says McGorman.

WHEN BIGGER ISN'T BETTER

"The large system integrators that I deal with are [targeting the mid-market] also, because the Global 500 is saturated with the integrator services as well," notes McGorman. And the Y2K Bug, which has been responsible for a slow-down in hardware sales, hasn't hurt sales in the ERP market

either. In fact, it helped by creating an excuse to buy ERP solutions.

"One of the challenges is to get through the year 2000," says Mike Janis, CEO of JGI Inc. (Rochelle Park, N.J.), integrator and HP reseller. "In '96, '97 and the early part of '98, there was an artificial spike in demand for ERP as the solution to replace Y2K (as well as replace legacy, non-year-2000-compliant custom applications) grew. If they didn't remediate, they would go out and buy a new system. It's why vendors like Baan, PeopleSoft and J.D. Edwards have slowed down a bit. We all [caught] part of the wave and we're experiencing a little downturn because that artificial spike in demand is over now."

Nevertheless, the expectations of IT managers and users are rising as additional business advantages (sup-

Susan Aluise

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ply-chain management and e-commerce, for example) come to light. "We see a growing need for e-commerce/e-business solutions as they relate to the backbone ERP system," Janis says. "We see a broader interest in supply-chain software and front-office software."

Because much of the dynamic growth in the ERP space is now coming from mid-sized companies, their different needs have created a significant shift. "The middle market buyer would like the solution provider to do most [of the work]," says Janis. "The upper-tier buyer still has the staff to select best-of-breed and amalgamate all of those things. There's got to be value-add; people will not just purchase for the sake of purchasing. They will not buy the prettiest product anymore, they're going to buy the product or the service that's going to give them the quickest return on investment."

MINIMAL IN THE MIDDLE

Allen Byers, manager of application consulting for Strategic Technologies Inc. (Cary, N.C.), an HP reseller that works with manufacturing and distribution companies with annual revenues under \$250 million, sees the unique needs of middle-market firms refocusing ERP providers, resellers and integrators. "In most [of our] cases, we see a minimal IT staff. And [they] are coming off of a wide variety of legacy environments. As they move forward into an HP environment, often times there's a lot of skills transfer required to let them move into this. Two key value-added components are training and outsourcing."

"We work with people all the way from demonstrating the software to help them understand the business processes and how it fits in all the way to doing remote database monitoring to have them actually maintain the database," Byers explains. "A lot of the companies that may only have one database administrator (DBA) have no backup vacation recovery plan, so we provide real-time, 24 hours-a-day database monitoring to have people keep their on-hand staffing cost down."

"Part of our strategy is to rely on,

not only complementary software partners, but infrastructure partners. And to focus on those partners, so that we reap the most benefits from them," says Charlie Allieri, program manager for Chicago-based System Software Associates' (SSA) eBPCS enterprise product suite.

According to Paul de Janosi, a partner at Benchmarking Partners, Inc. (Cambridge, Mass.), when companies move to an intelligent ERP solution, there are usually three key phases:

- Internal integration
- Supply-chain optimization
- Collaboration

"The first phase, the internal integration phase, is a way to break down the functional barriers and improve the processes to allow electronic information to be passed back and forth. The second phase, the supply-chain optimization phase, goes beyond their traditional Electronic Data Interchange (EDI) connections to now share information with suppliers and customers."

"And the third area is what we call the collaboration phase where people are deploying much more concentrated usage of e-commerce tools and the Internet and other sort of infrastructure-related things and actually redefining how their businesses are interacting with their customers and suppliers and the ultimate consumers."

VALUE-ADD

Consequently, those kinds of customer epiphanies and involvement have erupted into an emerging trend in the mid-market ERP market: the blurring of some of the lines that traditionally have separated resellers, integrators and ERP vendors. While large enterprises often opt for a "best of breed" information technology (IT) strategy, mid-sized companies seek out comprehensive solutions. As a result, the concept of providing "value-add" has become imperative for resellers, integrators and ERP firms.

Consequently, companies targeting the ERP market have mapped out

strategies to address those user needs. "Specifically for the mid-range companies that we are selling into, they require a completely integrated solution," says Peter Lopes, vice president, Psipenta USA, an ERP vendor that targets manufacturing organizations that manufacture large, highly engineered products such as subways. "They do not want to buy pieces anymore. They want to have all of the components fully integrated into one solution and provided by one vendor if at all possible. And that is what we are delivering to this marketplace: including the sourcing side from the supply chain on purchasing and managing outside contractors to the project management, the configuration, the product data management, that is required for this kind of environment."

Psipenta USA, which recently opened a North American headquarters in Westwood, Mass. is not an HP reseller. However, "HP hardware is very prevalent in this environment, especially among our UNIX users today," Lopes says. "It's becoming more so in the NT side. There's already a preference to that hardware platform. What happens today is we sell directly to our customers, we allow them to choose the hardware they want; but we say we run best on certain hardware. And one of those is on HP."

NO SMALL PARTS

SSA's decision last summer to focus exclusively on HP reflects a strategic shift for the firm that will have a significant impact on its enterprise business. "It's a huge part of our strategy," Allieri says. "We look at them as almost being a part of SSA. [Also], we were supporting other platforms on which we did not have a tremendous amount of installed base. So, it didn't make sense for us."

"What has further strengthened our relationship with them has been our decision to focus exclusively on HP for our UNIX platforms and our future NT platform, which should be released this summer," says Allieri. "Not only have [SSA's] resources been better focused and therefore we've been able to release faster to the

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The dynamic growth in the ERP space is now coming from mid-sized companies, their different needs have created a significant shift. "The middle market buyer would like the solution provider to do most [of the work]," says Janis.

marketplace better performing and better quality product, but also HP's interest and therefore participation with us has increased as well and has further been able to help us in delivering products faster than we'd expected. The NT product is an absolute example of that."

In the future, value-added ERP solutions are likely to become important even for mid-sized firms, particularly as they look to move more and more applications to the Web. "The mid-market can't afford the ERP solutions that SAP rolls out. They're not going to do a \$10 million SAP imple-

mentation," HP's McGorman says. "So what the SAPs and [other] enterprise vendors are doing is creating lower priced packages and the integrators are working with them to create practices around those packages that generate a repeatable solution."

From McGorman's point of view, there are several different components of supporting the efforts of ERP providers and integrators who are targeting mid-market companies. "At the highest level, we work with the ISV partners to make sure that their packages run on our platform and that they run very well. Next, we have

people taking those packages and creating a value chain for specific segments of the manufacturing market."

"We have tremendous demand, even from smaller companies in the mid-sized range to be able to put their products and services out into the supply chain and take advantage of the Web technologies that are available today to drive out all of the non-value-added activity within the organization," Byers says.

"The ability to put product catalogs and incorporate their order cycles out to their customer base and the ability to get away from the complications of EDI and other means of transmitting data to suppliers: We see that the Web is being adopted significantly even in the small, middle-market companies."

—Susan Aluise is a technology writer with the Washington News Bureau (Washington, D.C.).

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A Life In A Day Learning UNIX

ANYONE WHO KNOWS me knows I'm very good at looking for ways to avoid work. While browsing through the computer section of a large bookstore, I came across the

title *SAMS Teach Yourself UNIX in 24 Hours* (Macmillan Computer Publishing, July 1997). It got me thinking that I could just give this book out to people in my "Introduction to UNIX" class, then go back to the hotel and sleep until they finished reading.

Inside the front cover I found the proclamation: "In just 24 lessons of one hour or less, you will tackle every task you need to get the results you want." That made me wonder how they knew what results I wanted and sounded way too good to be true. Recognizing one of the authors as the creator of the *elm* mailer application, I decided I definitely needed the book.

Like any good techie, the next step was to find someone to buy it for me. One e-mail to the outstanding editors at *HP Professional* and the book appeared on my doorstep a few days later (sometimes I wish I were a columnist for a car or boat magazine).

THE CLOCK IS TICKING

Scanning the preface, I noticed that the authors are well qualified, having over 30 years of UNIX experience between them. It also said that if you spend some time trying things out, expect it to take more than 24 hours, which is a nice shot of realism, because you really can't learn computer subtleties without practice.

The table of contents indicated that I would learn the history of

UNIX, a large number of UNIX commands, regular expressions, vi, emacs, shell programming, C programming, Perl programming, networking and the Apache Web server. Wow! All that in 24 hours! And it took me 20 years.

So, I clicked the stopwatch and started reading. The first chapter was read easily in under an hour, leaving some time for people learning UNIX

to perform the activities section. Lots of interesting trivia about early UNIX was in there, except for the mention of Heidi's dog **BIFF** at U.C. Berkeley. Most people learning UNIX might find this bit of history unnecessary, but I was pleased, because it sets the right attitude.

What I was not pleased to see in the very first chapter were things like: alias apropos "man -k \!*luniq" add man -k \! to your .cshrc file man -k disk | grep '(1' talking about disk drivers.

No wonder so many people think UNIX is complex. If this first chapter is not enough to cause you to reject UNIX, nothing is. Most people just use a computer as a tool, and don't care about trivia or unnecessary details. This is a hard thing to learn for those of us that consider computers a profession. Undaunted, however, I continued on.

This lesson taught me that the book was primarily written for those sitting at Macs and Win32 PCs. The **login** discussion talked only about connecting to a UNIX box, though many people have an X-terminal or workstation on the desktop. Heck, if you can't figure out how to login, you probably don't need UNIX.

SNAP INTO ACTION

I decided to try one of the 'Action' sections. That was a bad choice. Step two told me that "Ninety-nine percent of the commands you type with UNIX don't change if you modify the punctuation and spacing." Wow! I never knew that, so I tried typing in **gr ep**, which caused a command not found error. Even **ls-l** didn't work, so I guess that spacing is rather important (**grep** and **ls-l** would work).

I don't know of many commands that use punctuation, so I didn't try that. The discussion in the book was about **whoami** vs. **who am I**. Those are about the **ONLY** commands I know where the spacing can be changed and they still work. Seemed like a bad example, especially for someone just learning UNIX.

The really scary aspect in this section was asking what happens to the date and time if you turn off or unplug your computer. Yikes! That's a Mac thing — UNIX boxes on a network are seldom shut off. I hope that not many readers tried this. The exercise section contains questions like "Can you have the same GID as someone else on the system?" which I think is a little bit too complex for



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someone with less than two hours experience. Especially since the answers are not listed anywhere that I can find (except back in the text of the chapter).

HOOR THREE

This was a pretty good description of the UNIX file system, although I noticed on page 42 that the sample directory listing had two entries with exactly the same name. Hope no beginners noticed that, because it's impossible on a UNIX system. The dynamic library discussion may be beyond the scope of what most people who are just trying to login, run programs to perform their job and manipulate files might need to know. But heck, I finished in less than an hour, so I'm still on schedule. I even tried the exercises, though the listing of /users was a bit of a problem because I was in an 800-node network and it was an NFS mount point.

As the hours wore on, my impression started to change. As a beginner's book and a guide to learning UNIX for a typical "Introduction to UNIX" class, this book would provide little but confusion. Very few people would have the perseverance to carry on and learn from it.

What I began to notice is that the text is not written for typical Mac or PC users, but for computer people. If you are a power user of any system, you will appreciate being told how true UNIX geeks pronounce /etc and mv. You will also know what to do when trying to login using upper case letters and it doesn't work. (This book says the system will act differently. Sure enough every system I have an account on worked differently: My login attempt was rejected.)

In the lesson for the sixth hour it says that you can't copy a directory with the cp command. An experienced computer person might try to

look in the man pages as described in chapter one and notice the -r or -R option that's been available on most systems for the last 10 years or so. That was a disturbing oversight, especially considering the standardization of most major UNIX systems commands with the UNIX95 branding event of 1995. An inexperienced user would believe it.

Although the book has many 'mistakes,' it has a certain appeal. I'd recommend it to system administrators of other systems trying to become more fluent in UNIX. I'd recommend it to full-on power users of other operating systems. And I'd recommend it to people who've been around UNIX for some time and want to fill in some details. But, in no way would I recommend the book to people with 24 extra hours on their hands who want to learn UNIX. Darn! Looks like I'll just have to keep teaching UNIX classes. ♦

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NT Adds On UNIX — Almost

IN TRYING TO MUSCLE its way into the enterprise, Microsoft has made a commitment to interoperate Windows NT with as many platforms as possible. By providing software to support

IBM SNA and OS/400, Novell NetWare and Apple Macintosh, it's trying to eliminate any reason to exclude Windows NT from your network.

But, one of the most common complaints has been a lack of UNIX interoperability. Microsoft's new selection of tools designed to provide the essential software necessary for Windows NT to interoperate with UNIX systems is bundled in the *Windows NT Services for UNIX Add-On Pack* (SFU).

SFU goes a long way towards addressing some common NT/UNIX interoperability problems. In the past, Microsoft has maintained that these concerns were addressed by providing solid, basic TCP/IP services such as file transfer with FTP and printing with LPR/LPD. Of course, everyone knows that more is required for true interoperability.

NFS: NEVER FIRST SOFTWARE

One of my biggest complaints has been lack of support for Sun's Network File System (NFS). NFS has long been the most common way for UNIX systems to act as file servers. While third-party products have been available, SFU is Microsoft's first attempt at an NFS server and client. In fact, Microsoft is using Intergraph

Corp's (Huntsville, Ala.) *Access NFS Gateway* product in SFU.

The NFS client allows NT to access files on any NFS server. The client is tightly integrated into NT so shared files appear in Windows Explorer like local disks or NT shares. The NFS server is also tightly integrated with NT: It's a native Win32 API multithreaded kernel application. Security is provided with the Windows NT domain security model so that standard security practices don't need to be modified.

The server supports all NT file systems (FAT, NTFS, CDFS and HPFS) so you can share any files. A GUI is provided to make managing the server quite straightforward. Both the client and server support NFS 3.0, which provides good performance and is backward compatible.

SFU addresses another common complaint: password synchronization. A new service allows users to keep a common password between NT and UNIX. The service automatically sends an updated password as either clear or encrypted text to the UNIX system whenever it's changed in NT. The synchronization only works in one direction: NT-to-UNIX. In other words, changes on the UNIX side will not be reflected on NT, so users must always change their passwords from NT.

To aid in remote administration of both NT and UNIX systems, a telnet client and server are included. The client supports a wider variety of ter-

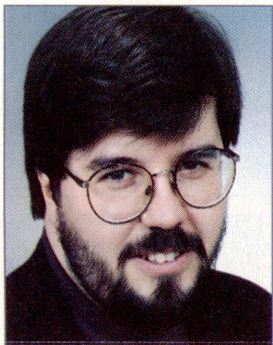
minal types than the one included with NT. The server is actually quite stable, unlike the telnet server provided in early NT Resource Kits.

LAN MAN CAN

An important feature is support for *NT LAN Manager* (NTLM) authentication. Now you can manage an NT system through telnet while using NT's built-in security. This is important because telnet logins can be readily tracked in the event viewer and group permissions and rights can be enforced. NTLM authentication works only between NT telnet clients and NT telnet servers.

A basic Korn Shell (licensed from Mortice Kern Systems) is included with 25 commands that are a subset of MKS Toolkit. These commands provide the basic structure to allow a UNIX person to work in NT. Additionally, basic scripts may be ported from UNIX systems to run on NT. All the fundamentals are here including **ls**, **cat**, **chmod**, **more** and **grep**. Also included are the **vi** editor and **sed**, the stream editor. Perhaps the most important inclusion is **perl**, the popular scripting language interpreter, which means that many aspects of system management can be automated.

There are still some pieces missing from SFU for true coexistence. My pet peeve has always been the lack of a free **sendmail** equivalent and **POP3** server support. It's beyond me why this fundamental communication software isn't included with NT or available free from Microsoft. Other



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noticeable missing elements from SFU are tools to read UNIX tapes, such as *cpio* and *tar* and compression tools such as GNU *zip*.

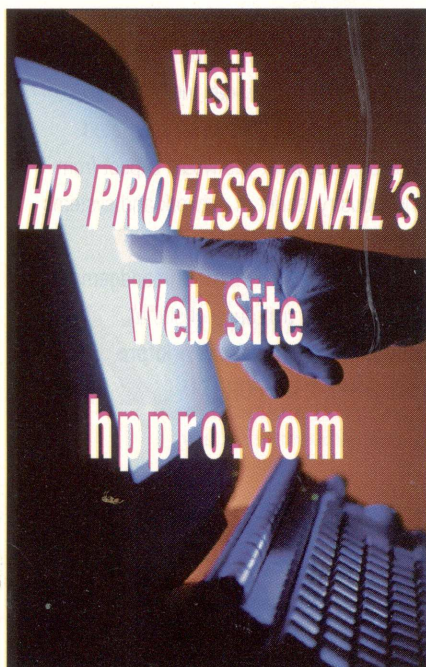
A WORK IN PROGRESS

SFU has the feel of an unfinished product. It appears to be a product released early in order to satisfy demands from users. There are other very fine products in this area, notably the *MKS Toolkit* (the full package) and *Interix* from Softway Systems. (See "Migration Without Migraines," *HP Professional*, November, 1998 for a discussion of these tools.)

I would also argue that because the goal is to get NT deeper into the enterprise, nearly everything in the package (with the possible exception of the NFS server) should be rolled into NT's base operating system. If support for NetWare and Macintosh is included, why not support for UNIX?

Windows NT *Services for UNIX Add-On Pack* is available now for an estimated price of \$149. It requires either NT Server or Workstation 4.0 with Service Pack 3 or above. ♦

—Ryan takes on 64-bit server software in next month's issue.



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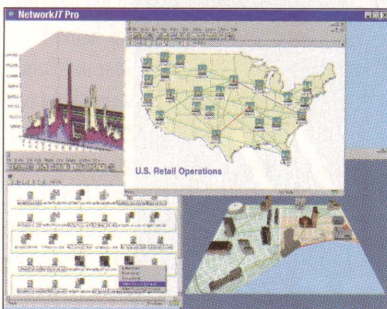
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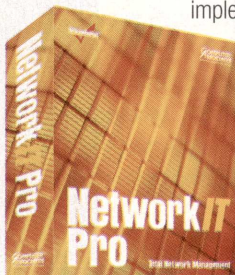
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Managing ERP Ecosystems

THE WORLDWIDE MARKET is expected to climb to an estimated \$55 billion for ERP-related systems, support and services by 2000. These “ERP Ecosystems” are ERP

implementations that include ERP software vendors, systems integrators, systems manufacturers, distributors and IT infrastructure providers. For all parties involved, the ideal situation is a customer-vendor relationship that ensures a successful execution.

Because implementing ERP causes organizations to make significant investments in an enterprise-wide project that is truly mission-critical (often uncharted territory for those new to ERP), it often becomes a “life altering” experience for not only IT employees, but the rank and file as well.

TO INFINITY AND BEYOND

ERP projects generally include some kind of expansion: adding more users, implementing additional core modules or embarking on data warehousing, supply chain management or sales force automation. Adding to the complexity, these kinds of enterprise-wide projects *rarely come to an end*. All of these factors make choosing the right reseller partners critical.

There is significant risk for customers implementing ERP because there are key infrastructure issues that — if not planned for — can easily stall or derail a project. First, the hardware and services associated with ERP implementations tend toward the

higher-end: multiple high-performance servers and disk arrays, backup devices and archiving. In addition, the implementation services necessary for a successful ERP project are complex-tasks such as high-availability, backup/restore and enterprise monitoring and management.

Unfortunately, the level of expertise needed to guide customers through these issues rarely comes from hardware-only resellers “selling boxes.” The answer is for IT professionals to partner with infrastructure experts that not only resell but have teams with proven success in the complex world of ERP.

HOW MUCH VALUE?

This should include a commitment to developing quality business alliances and making investments in the training and development of internal staff. And the willingness to provide custom ERP programs and services designed to add customer value.

While that may be true for some of the players within the ERP Ecosystem, in reality, few hardware resellers have earned the status of true ERP *implementation partners*. The missing link is the absence of *value-added services*.

True value-add is generated from the application of deep technical expertise which is required to architect, build and implement the IT infrastructure necessary to support the new ERP Ecosystem and position

it to deliver on expectations. This requires ongoing investments in ERP bolt-on software providers (those companies providing ERP application management, ERP archiving, ERP backup/restore, ERP capacity planning, ERP network impact product providers); training programs offered by ERP software vendors as well as custom training.

PROVING GROUND

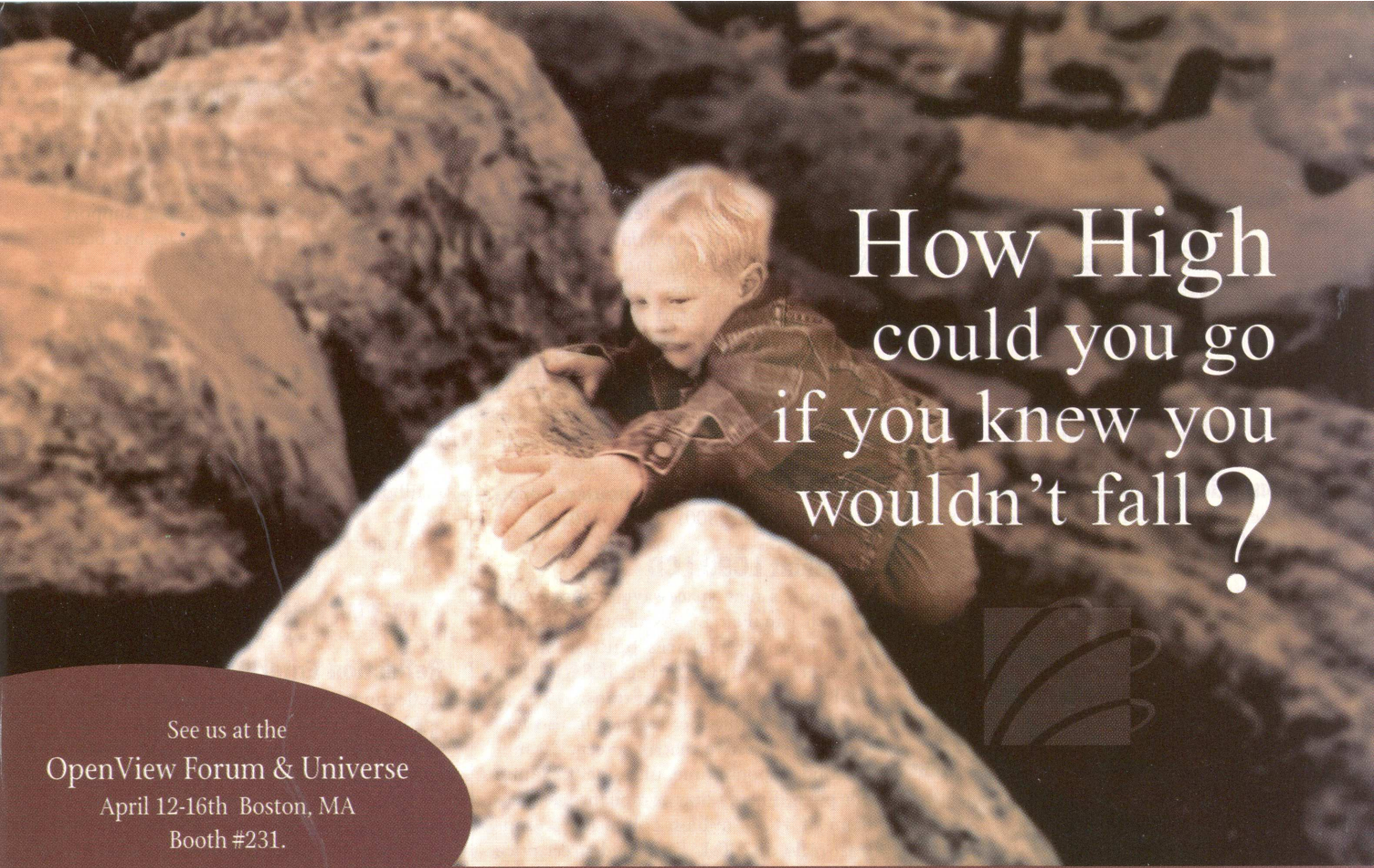
Another such value-added service which clearly benefits customers is a lab facility equipped with the latest versions of leading ERP software packages and associated hardware. This kind of facility allows for the test driving of applications in a risk-free environment. And, of course, it's also wise for resellers to stay close to the industry's new product offerings and enhancements through the ongoing participation in seminars and technical conferences.

Because of this, more and more businesses will be faced with the challenge of identifying ERP partners who distinguish themselves by demonstrating and optimizing true value. Doing the homework for choosing an infrastructure partner with the best combination of options, expertise and alliances will set the stage for the ERP customer's satisfaction and success.

—Chris Wood, Alliance Manager,
Forsythe Solutions Group,
is a 14-year IT industry veteran who
has worked for Chrysler Motors, Sun
Microsystems and SCO.



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Expresso supports a majority of the development environments, such as Visual Café, Visual Age, JBuilder, JFC and JDK, Java Studio, Forte, Visual Basic, WebObjects and Application Servers from companies like, SilverStream, Netscape, BlueStone, Apple and others.

Contact Conexions, Inc., North Andover, MA at (978) 689-3570.

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The Professional Workstation AP200, AP400 and AP500 all feature single or dual Pentium III 500MHz CPUs. The AP400 and AP500 models feature enhanced PowerStorm 300 graphics drivers. Workstations start at \$2,259 for an AP200 with 64MB RAM, 10GB Ultra ATA 7,200 rpm hard drive and Matrox Millennium G200 AGP graphics card.

New Prosignia desktops with Pentium III 450 or 500 CPUs with a 17-inch monitor start at \$1,899.

Contact Compaq Computer Corp., Houston, TX at (800) OK-COMPAQ.

PanaFlat LC90 LCD

Panasonic's new space-saving, super-thin, 19-inch PanaFlat LC90s digital multiscan LCD monitor features built-in stereo speakers and five Universal Serial Bus (USB) connectors that can transfer files at up to 12 megabits per second. It also features a TFT active matrix screen, 30 millisecond response time, ultrafine 0.294mm dot pitch, Energy Star compliance, a spectrum of 16.77 million colors and a contrast ratio of 200:1. Estimated street price is expected to be \$2,000.

Contact Panasonic Communications & Systems Company, Secaucus, NJ at (800) 742-8086.

DISASTER RECOVERY AND SECURITY

iKey Model m0 USB Tokens

Rainbow Technologies, Inc. has announced a new exportable model of its OEM line of strong authentication USB-based tokens, the iKey Model m0. The globally available iKey Model m0 can be integrated by OEMs and application developers to provide end user client authentication without violating export restrictions.

Rainbow also announced that digital certificate storage and 1024-bit RSA support through PKCS #11 are available with Model m2 of the iKey. The new model allows users to sign, verify and securely store up to four digital certificates.

Contact Rainbow Technologies, Irvine, CA at (800) 852-8569.

MESSAGING AND E-MAIL

Internet/X.400 Message Switch 4.1

Isode, Inc. has included two new features to prevent Unsolicited Bulk E-Mail (UBE) in its Internet/X.400 Message Switch 4.1. Authorization checks on senders and

recipients are now undertaken prior to entry to the Message Switch and support for the Realtime Blackhole List has been added.

It now provides three rejection mechanisms for SMTP e-mail; rejection of the SMTP connection, generating a non-delivery report which commonly cannot be delivered with UBE, and now rejection of a message at the SMTP protocol level before it enters the Switch.

Prices range from \$1,800 for up to 100 mailboxes, to \$7,800 for unlimited mailboxes.

Contact Isode Inc, Austin, TX at (512) 231-8993.

NETWORK INTEGRATION

Reflection EnterView 2.0

Reflection EnterView is a centrally-managed, Java-based host access solution from WRQ. It gives users access to IBM, UNIX, and Digital hosts from a desktop browser.

Reflection EnterView 2.0 includes: built in security based on TLS (for individuals outside the corporate firewall); Deployment Director for installation and management; and scalability to provide web-based host access to an infinite number of users. Unlike EnterView 2.0, any Web-to-host products are server-dependent, hampering IT's ability to add new users and sessions and potentially limiting the number of available applications.

Contact WRQ, Inc., Seattle, WA at (800) 872-2829.

PRINTERS

Print Server And 3Port Card

Troy XCD has announced a new VxWorks-compatible software only OEM print server and a 3 port combination USB-parallel-serial card for HP printers.

The Soft Print Server Print Protocol Library for VxWorks allows OEM printer manufacturers and printer controller manufacturers to use the existing processor on their printer controller to handle network printing applications. It eliminates the need for separate print server processor, memory and interface circuitry.

The 3Port EIO card is a combination USB-parallel-serial card for any HP printers that use the Enhanced I/O (EIO) expansion slot. All three 3Port ports can be used concurrently for sharing by multi-processor computers.

Contact Troy XCD, Inc., Irvine, CA at (949) 399-0820.

Sometimes You Don't Know What You've Got Till It's Gone



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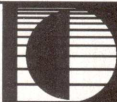
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STORAGE**Ventana SAN Manager 2.0**

Gadzoox Networks, Inc., has released Ventana SAN Manager 2.0. for the deployment of proactively managed SANs.

Through the use of distributed intelligent agents and SNMP management protocol, Ventana 2.0 employs an extensive set of policy-based, proactive management capabilities. Ventana 2.0 provides a GUI for configuring and managing redundant failover links in high availability SAN environments. Intelligent agents monitor the links and initiate policy-based re-routing of traffic. It provides traffic analysis that monitors network utilization and helps identify SAN "hot spots." Ventana 2.0 sells for \$550.

Contact Gadzoox Networks, Inc., San Jose, CA, at (888) 423-3222.

SYSTEM AND NETWORK MANAGEMENT**Helpdesk Ace And Runtime 2.0**

Helpdesk Ace and Helpdesk Runtime are client-server tools for LAN administrators or outside support to quickly identify and resolve user PC problems. The software facilitates user support request by creating trouble tickets using an Access 97 database. Helpdesk Runtime is a runtime version of Helpdesk Ace, which does not require Microsoft Access 97 on each client workstation.

Helpdesk Ace 2.0 sells for \$99.95 and the Run Time Solution sells for \$149.95 retail. The software will run on Windows 95 and NT 4.0 Workstations.

Contact LAN Technology Solutions, Camarillo, CA at (805) 482-8616.

WORKFLOW AND DOCUMENT MANAGEMENT**Connectivity Pack for SAP R/3**

StreamServe's Connectivity Pack for R/3, which is SAP BAPI certified, interfaces seamlessly with R/3 release 4 using the Raw Data Interface (RDI), and extends R/3 Release 3 to provide RDI-like functionality. In addition, page oriented input from any release of R/3 or R/2 is supported. Users of SAP R/3 Release 3 are now able to automatically convert existing document designs, developed using ABAP/4 programming and SAPscript Layout Sets, to a format easier to maintain and which provides expanded capabilities for flexible document and output processing, formatting and distribution.

Contact StreamServe, Inc., Raleigh, NC at (919) 786-7300.

YEAR 2000**Web Site Checks PCs For Y2K**

WebVentory, powered by WRQ's Express 2000, is on-line at www.webventory.com. Jointly developed by WRQ, Inc. and WebVision, it gives an organization an assessment of its PCs' Y2K readiness and offers strategies for bringing PCs into compliance. WebVentory gives the readiness status of PC hardware (BIOS), operating systems and applications. The product makes recommendations about what the PC needs to function correctly. A report shows if a BIOS fix is available and where to get it, where to go for patches to bring operating systems into compliance and whether there's a compliant upgrade.

Contact WRQ, Inc., Seattle, WA at (800) 872-2829. ♦

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ADVERTISER'S
INDEX**

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ADVERTISER**PAGE #**

Anritsu Corporation	19
Aurora Software, Inc.	39
CFS	21
Champsystems	35
Comdisco	C2
Computer Associates	40
Computer Network Technology Corporation	23
DCI - Digital Consulting Inc.	41
DIS Research	11
Forsythe Solutions	13
Hewlett Packard	6-7
Hewlett Packard	4
Hewlett Packard	31
Hewlett Packard	17
HiComp America	33
HP Openview	C3
Hummingbird Communications	C4
Melillo Consulting	25
Mitchell Humphrey	27
NHCSI	37
Polaris Service, Inc.	34
SMA	37
SunGard Recovery Services	45
Syntax	15
Sysix	43
TSA	2
Xerox Corp	9

MARTKETPLACE

Abtech Systems	46
Black River Computers	46
CFS	46
Computer and Web Publications, Inc. ...	46
I/O Data Systems Inc.	46
Monterey Bay Communications	46
Ted Dasher & Assoc.	46

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E-COMMERCE

WebQoS Version 2

HP has announced WebQoS Version 2, and that it has teamed with Netscape Communications Corporation. WebQoS Version 2 protects Web-site and application performance and optimizes use of server resources. It lets businesses identify and prioritize Web-site visitors to ensure that priority transactions, such as purchasing, take precedence over general browsing. WebQoS on HP-UX 10.20 and 11 enhances Netscape Enterprise Server 3.6 with performance protection and user and service prioritization.

url: www.hp.com/go/webqos

OpenPix ImageHub

OpenPix ImageHub lets distributed enterprise teams use their networks as strategic, real-time communications vehicles and lets users organize, annotate, zoom, pan, share and print rich-image content with bandwidth efficiency across networks.

HP also is developing an OpenPix Web-based service for Web development professionals. The OpenPix instant-imaging service enables Web builders to create and share rich-image content quickly and to showcase it with existing and potential clients. The beta version of this new OpenPix Web service is now available at www.openpix.com.

HP OpenPix ImageHub pricing starts at \$19,995 for a single server with 10-client access licenses and unlimited viewer licenses.

url: image.hp.com

HP Shopping Village Expands

The HP Shopping Village online store now offers the HP 2000C and HP 2500C Professional Series color printers for business users. HP also has filled out its peripherals offerings on the site, adding the full line of HP's personal- and small-workgroup LaserJet printers and all-in-ones, and completing the offering of HP DeskJet printers. New HP ScanJet scanners are slated to be added to the site later this month.

url: www.shopping.hp.com

PRINTING

Driver For AutoCad2000

HP's new Windows driver for AutoCad2000 enables users of the new HP DesignJet 1000 Series and other HP DesignJet printers to print directly from AutoCAD using the Windows system driver instead of a separate Windows driver just for AutoCAD. AutoCAD2000 adapts most of the CAD-oriented features and moves them from the driver level to the application level.

It includes an "always print" option, which allows customers using HP DesignJet printers with limited memory to print large files and improved line quality is possible via the resolution-enhancement technology.

SECURITY

Free License For DomainGuard Security Software

Through May 31, individual sites within a single company can receive a free 50-user license for the DomainGuard Access Manager — a \$1,995 value. In addition, these customers also will receive special discounts for upgrading to a 500-user license for either DomainGuard Access Manager (a \$2,995 savings) or DomainGuard Rules Manager (a \$4,995 savings).

url: www.hp.com/security/free_now

SERVERS

New Reliability Products For NetServers

HP announced new reliability offerings for HP NetServer products, as well as support for the new 500MHz Pentium III processor in the HP NetServer LC 3, LPr and LH 3 systems and next-generation NetServer E Series systems.

The new reliability offerings include: one-button disaster-recovery tape backup devices for achieving a complete disaster-recovery solution will be available first on the NetServer LC 3 platform; HP TopTools new "phone home" capability will enable HP NetServers to automatically notify HP's Response Center of problems and initiate corrective action; and HP OpenView ManageX/SE 4.0 with support for Novell Netware and new policies that allow proactive steps to be taken for pre-set error conditions.

SERVICES

Purchase HP 9000's Online

HP's new Electronic Solutions.Now (ESN) is a free, secure Web site featuring a set of electronic business tools that allow enterprise customers to purchase HP 9000 Enterprise Servers, storage and support services online. ESN delivers enterprise customers a customizable Web site with detailed information regarding their HP business interactions.

WORKSTATIONS

Pentium III Kayaks

The new HP Kayak XA PC Workstations feature Intel's 500MHz Pentium III CPU, the Intel 440BX AGPset chip set, up to 768MB of 100MHz ECC SDRAM memory and 6.4GB 7,200 rpm Ultra ATA or 9.1GB wide Ultra SCSI hard-disk drives.

The HP Kayak XA-s PC Workstation accommodate up to two 500MHz Pentium III processors and are configured with 128MB of 100MHz SDRAM memory (expandable up to 768MB) and 7,200 rpm 10.1GB Ultra ATA or 9.1GB Ultra Wide SCSI hard drives.

The HP Kayak XU PC Workstation features support for up to two processors; CL2 ECC SDRAM memory; expandability up to 1GB, HP FastRAID; and Fast Wide Ultra SCSI 10,000 rpm 4.5GB or 9GB Seagate Cheetah drives.

url: www.hp.com/go/kayak

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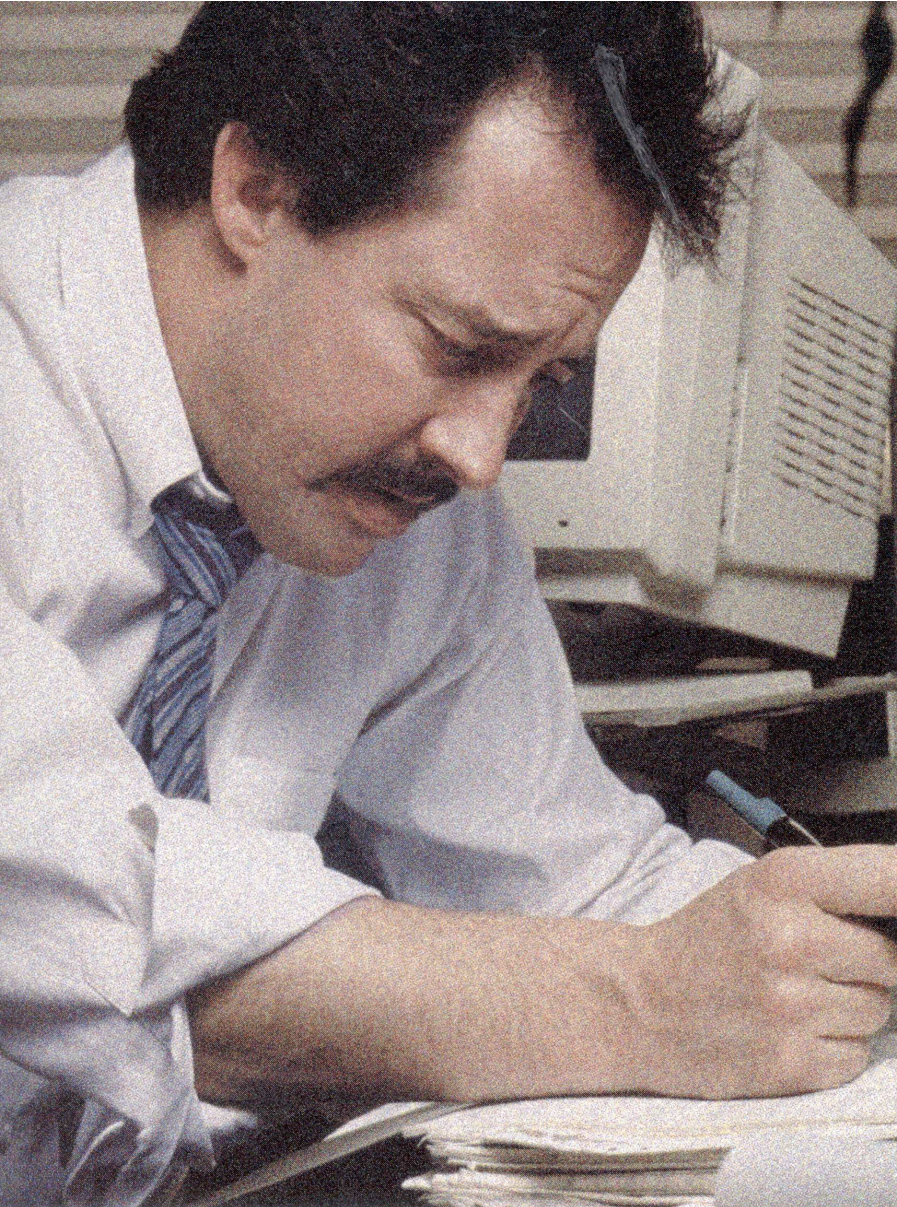
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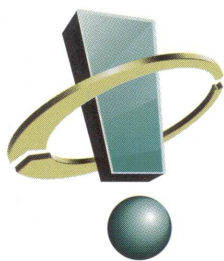
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